







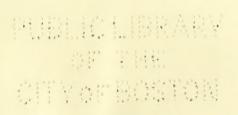
# THE INDUSTRIAL ARTS INDEX

THIRD ANNUAL CUMULATION

SUBJECT INDEX TO A SELECTED LIST OF ENGINEERING
AND TRADE PERIODICALS FOR 1915

**EDITED BY** 

MARION E. POTTER, LOUISE D. TEICH AND HELEN M. CRAIG



THE H. W. WILSON COMPANY WHITE PLAINS, N. Y. and NEW YORK CITY 1915

4031,32 1915 cont.

m Scireb.

HOR

Vol. III

December, 1915

No. 5

Published February, April, June, October, December by THE H. W. WILSON COMPANY

White Plains, N: Y......39 Mamaroneck Ave. New York City.......501 Fifth Ave.

Full information in regard to subscription price will be supplied on request.

With this issue the Industrial Arts Index completes its third year. Although it is the annual volume for 1915 it indexes most of the magazines for December 1914 and only a few for December 1915. The Proceedings of the American Gas Institute, Journal of the Boston Society of Civil Engineers, Journal of the Institution of Electrical Engineers and The University of Minnesota Studies in Engineering have been added this year.

There have been many suggestions for further additions to the list of periodicals indexed. Among these are the Bulletin of the American Railway Engineering Association; Canadian Mining Institute Quarterly Bulletin; Gas Age; Gas World (London); Journal of Electricity, Power and Gas; Journal of Gas Lighting (London); London Times (Engineering Supplement); Mining and Engineering World; Mining Press; Proceedings of the Electric Light Association; Printer's Ink; Printing Art; Bulletin of the Society of Automobile Engineers; Technology Monthly and Harvard Engineering Journal; American Lumberman.

Any of our subscribers who may be interested in having one or more of these periodicals indexed are asked to send us their votes. Any suggestions as to other additions or improvements will also be carefully considered.

There are several other periodicals which would be indexed in the Industrial Arts Index if the publishers were willing to furnish us copies for the purpose. It is for this reason that Ice and Refrigeration, Electric Journal, American Machinist, and Proceedings of the American Society of Civil Engineers are not included.

# National Preparedness and Military Training

A new aid to the many who are discussing "preparedness" is the Abridged Debaters' Handbook on military training, just published by The H. W. Wilson Company (25c.). This covers the question of military training in schools and colleges, gives a list of organizations working for or against national defense, a brief, six pages of bibliography, and fifty-five pages of excerpts on both sides of the question. National Defense, one of the titles in the Debaters' Handbook series, price \$1.00, should be used to supplement the one on military training, if fuller information as to the present strength of our national defenses is desired.

A larger handbook on military training, in the regular series, will be issued as soon as the amount of valuable new material seems to warrant it. This handbook will include the question of compulsory military service.

#### Notes and Announcements

The Civil Engineers' Society of St. Paul began in November the publication of a monthly bulletin. This publication "is for the purpose of giving to the society an organ through which it may advocate a better understanding of the engineering profession in relation to the public welfare."

The Journal of the Association of Engineering Societies will be discontinued with the December, 1915, issue, owing to the disbanding of the Association on December 31, 1915. The Engineers' Club of St. Louis, the largest society in the Association and its active head for the past two years, will begin the publication of a bi-monthly journal to be known as the Journal of the Engineers' Club of St. Louis.

The Associated Technical Men, an association formed in 1914 for the purpose of furthering the interests of technical men, has commenced the publication of a monthly bul-

## NOTES AND ANNOUNCEMENTS

letin to keep all members of the society informed as to its progress and to acquaint non-members with the work it is doing. A. M. Wolf, 180 North Dearborn Street, Chicago, is editor of the publication.

The first number of the Utilities Magazine was published in July, 1915. This is the official organ of the Utilities Bureau, which grew out of the conference of American mayors on public policies as to municipal utilities, held in Philadelphia, in November, 1914. In November, 1915, a Valuation Conference under the auspices of this bureau was held in Philadelphia, seven sessions being held. The proceedings of the conference will be made available in the January issue of the Utilities Magazine.

The Rhode Island Highway News, the first number of which was issued in September, 1915, is a publication of the State Board of Public Roads, and is similar to those which are issued by the highway authorities of several other states. It contains short articles on the maintenance of bituminous macadam and water bound macadam roads, a description of the business methods in the office of the board and discussions of various phases of construction and maintenance work.

There were no numbers of the Journal of the Institution of Electrical Engineers published between the issues of June 15 and Dec. 1.

The first issue of the new quarterly Bulletin of the National District Heating Association has made its appearance, being dated October, 1915. The bulletin is of standard magazine size. Under the committee heading, it is stated that the station operating committee will take up, among other things, the subjects of (1) oil as a fuel; (2) bleeder type of turbogenerator, and (3) operating data relative to a certain heating plant on which accurate information will be obtained by the committee through tests made by one of the member companies.

The Textile World Record, published by the Lord & Nagle Company, and the Textile Man-

ufacturers Journal, published by J. H. Bragdon & Company, have been consolidated to form a new publication known as the Textile World Journal. This is issued weekly, combining the news and market report features, which have been a specialty of the Textile Manufacturers Journal, and the technical machinery and special features of the Textile World Record. The Bragdon, Lord & Nagle Company, Incorporated, publish the Textile World Journal at their publication office, 377 Broadway, New York.

The Railway Electrical Engineer, which has been published by the Wray Publishing Company, at Chicago, has been bought by the Simmons-Boardman Publishing Company, the publisher of the Railway Age Gazette, and the Signal Engineer. Beginning with November it will be published by the Simmons-Boardman Publishing Company from its New York office. It will not be consolidated with any of the other periodicals of this company, but will be continued as a separate monthly publication.

The Colliery Engineer, formerly published by the International Textbook Company, at Scranton, Pennsylvania, has been purchased by the Hill Publishing Company, and was consolidated with the Coal Age in November. The latter periodical will be added to the list of those indexed in the Industrial Arts Index.

Among the magazines suggested for indexing in the Industrial Arts Index is the Mining and Engineering World, published in Chicago. The weekly issues of this magazine contain the titles of articles on mining, metallurgy and geology appearing in American and foreign periodicals. These are cumulated in semiannual volumes, and published as the Mining World Index of Current Literature. Some four hundred periodicals are indexed, also publications of schools, societies, and government bureaus, and new books. The index has a classified arrangement, and, in many cases, a brief annotation follows the title. The seventh volume, covering January to June, 1915, has recently been published.

# List of Periodicals Indexed

- Am Chem. Soc J—Journal of the American Chemical Society. \$6. Charles L. Parsons, sec., Box 505. Washington, D. C.
- Am Eng—American Engineer. See Ry Age (Mech ed).
- Am For—American Forestry, \$3; single numbers 25c American Forestry Assn., 1410 H St, N. W., Washington, D. C.
- Am Gas Inst Pro—Proceedings of the American Gas Institute, ninth annual meeting, 1914. \$7.50 to libraries. American Gas Institute, 29 W 39th St, New York.
- Am Gas Light J—American Gas Light Journal. \$3; single numbers 10c. American Gas Light Journal, 42 Pine St, New York.
- Am Ind—American Industries. \$1; single numbers 10c. National Manufacturers Co., 30 Church St. New York.
- Am Inst Arch J—Journal of the American Institute of Architects. \$5; single numbers 50c. American Institute of Architects, The Octagon, Washington, D. C.
- Am Inst E E Pro—American Institute of Electrical Engineers. Proceedings. \$10; single numbers \$1. F. L. Hutchinson, sec., 33 W 39th St, New York.
- Am Inst Min E Bul—Bulletin of the American Institute of Mining Engineers. subs. \$10; single numbers \$1; to members, public libraries, and educational institutions, \$5; single numbers 50c. B. Stoughton, sec., 29 W 39th St, New York.
- Am Soc Heat & V E—Transactions of the American Society of Heating and Ventilating Engineers, American Society of Heating and Ventilating Engineers, 29 W 39th St, New York.
- Am Soc M E J—Journal of the American Society of Mechanical Engineers. \$3; single numbers 35c. American Society of Mechanical Engineers, 29 W 39th St, New York.
- Am Water Works Assn J—Journal of the American Water Works Association, American Water Works Assn., 2419 Greenmount Av, Baltimore, Md.
- Arch & Bldg—Architecture and Building. \$2; single numbers 20c. William T. Comstock Co., 23 Warren St, New York.
- Arch Rec—Architectural Record. \$3; single numbers 35c. Architectural Record Co., 115 W 40th St, New York.
- Assn Eng Soc J—Journal of the Association of Engineering Societies, \$3; single numbers 30c. Association of Engineering Societies, J. W. Peters, sec., 3817 Olive St, St. Louis, Mo.
- Automobile—Automobile. \$3; single numbers 10c. Class Journal Co., 231 W 39th St, New York.
- Bldg Age—Building Age. \$2; single numbers 20c, David Williams Co., 239 W 39th St, New York.
- Boston Soc C E J—Journal of the Boston Society of Civil Engineers. \$4 (ten numbers); single numbers 50c. Boston Society of Civil Engineers, 715 Tremont Temple, Boston.
- Brickb—Brickbuilder. \$5; single numbers 50c. Rogers & Manson Co., 85 Water St, Boston.
- Colliery—Colliery Engineer. \$2; single numbers 25c Hill Pub Co., 10th Av at 36th St, New York.
  - Consolidated with Coal Age on Nov. 6.
- Concrete Cem—Concrete-Cement Age. \$1.50; single numbers 15c. Concrete-Cement Age Pub. Co., 97 West Fort St, Detroit, Mich.
- Dom Eng—Domestic Engineering. \$2; single numbers 10c. Domestic Engineering Co., 445-447 Plymouth Court, Chicago.
- Econ Geol—Economic Geology, \$3; single numbers 50c. Economic Geology Pub. Co., 41 North Queen St, Lancaster, Pa.

- Elec Ry J—Electric Railway Journal. \$3; single numbers 10c. McGraw Pub. Co., 239 W 39th St, New York.
- Elec R & W Elec'n—Electrical Review and Western Electrician. \$3; single numbers 10c. Electrical Review Pub. Co., 608 S Dearborn St, Chicago.
- Elec W—Electrical World. \$3 single numbers 10c. McGraw Pub Co., 239 W. 39th St, New York.
- Engineer—Engineer. Thick paper ed £2 6d; Canadian subs £1 16s; thin paper ed £1 16s; Canadian subs £1 11s 6d. Engineer, 33 Norfolk St, Strand, London, W. C.
- Eng & Contr—Engineering and Contracting. \$2. Myron C. Clark Pub. Co., 608 S Dearborn St, Chicago.
- Eng & Min J—Engineering and Mining Journal. \$5; single numbers 15c. Hill Pub. Co., 10th Ay at 36th St, New York.
- Eng M—Engineering Magazine. \$3; single numbers 25c. Engineering Magazine Co., 140 Nassau St, New York.
- Eng N—Engineering News. \$5; single numbers 15c. Hill Pub. Co., 10th Av at 36th St, New York.
- Eng Rec—Engineering Record. \$3: single numbers 10c. McGraw Pub. Co., 239 W 39th St, New York.
- Eng Soc W Pa—Proceedings of the Engineers' Society of Western Pennsylvania. \$5; single numbers 50c. Engineers' Society of Western Pennsylvania, 2511 Oliver Bldg, Pittsburgh, Pa.
- Foundry—Foundry. \$1; single numbers 15c. Penton Pub. Co., Penton Bldg, Cleveland, O.
- Gen Elec R—General Electric Review. \$2; single numbers 20c. General Electric Co., Schenectady, N. Y.
- Good Roads n s—Good Roads new series. \$2; single numbers 5c except first numbers of each month 10c. E. L. Powers Co., 150 Nassau St, New York.
- Heat & Ven—Heating and Ventilating Magazine. \$1; single numbers 10c. Heating & Ventilating Magazine Co., 1123 Broadway, New York.
- Horseless Age—Horseless Age. \$2; single numbers 10c. Horseless Age Co., 440 4th Av, New York.
- III U Eng Exp Sta Bul—Illinois University Engineering Experiment Station. Bulletin. Univ. of Ill., Urbana.
- Illum Engr—Illuminating Engineer. 10s 6d; single numbers 1s. Illuminating Engineering Pub. Co., 32 Victoria St, London, S. W.
- Illum Eng Soc—Transactions of the Illuminating Engineering Society. \$5; single numbers 75c. Illuminating Engineering Soc., 29 W 39th St. New York.
- Ind Eng—Industrial Engineering and Engineering Digest, \$2; single numbers 20c. Technica Literature Co., 120 W 32d St, New York.
- Inland Ptr—Inland Printer. \$3; single numbers 30c. Inland Printer Co., 632 Sherman St, Chicago
- Inst E E J—Journal of the Institution of Electrical Engineers. single numbers 3s 6d. E. & F. N. Spon, Ltd., 57 Haymarket, London, S. W.; Spon & Chamberlain, 123 Liberty St, New York.
- Int Marine Eng—International Marine Engineering. \$2. Aldrich Pub. Co., 17 Battery Place, New York.
- Iron Age—Iron Age. \$5; single numbers 20c. David Williams Co., 239 W 39th St, New York.
- Iron Tr R—Iron Trade Review. \$4; single numbers 15c. Penton Pub. Co., Penton Bldg., Cleveland, O.

## LIST OF PERIODICALS INDEXED

- J Account—Journal of Accountancy. \$3; single numbers 30c. Ronald Press Co., 20 Vesey St, New York.
- J Fr Inst-Journal of the Franklin Institute. single numbers 50c. Franklin Institute, Philadelphia.
- J Ind & Eng Chem—Journal of Industrial and Engineering Chemistry. \$6. American Chemi-cal Society, Easton, Pa.
- Locomotive—Locomotive. 50c; single numbers gratis; recent bound volumes \$1. Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Mach—Machinery. Engineering edition \$2; coated pa. \$2.50; single numbers 20c. Industrial Press, 140 Lafayette St, New York.
- Met & Chem Eng—Metallurgical and Chemical Engineering. \$3; single numbers 25c. McGraw Pub. Co., 239 W 39th St, New York.
- Metal Ind n s-Metal Industry new series. \$1; single numbers 10c. Metal Industry, 99 John St, New York.
- Metal Work—Metal Worker, Plumber & Steam Fitter. \$2; single numbers 10c. David Williams Co., 239 W 39th St, New York.
- Minn U Bul—University of Minnesota. Studies in engineering. Univ. of Minn., Minneapolis Munic Eng—Municipal Engineering. \$2; single numbers 25c. Engineering Pub. Co., 702 Wulsin Eldg. Indiannalis. Ind. Bldg, Indianapolis, Ind.
- Munic J-Municipal Journal. \$3; single numbers special numbers 25c. Municipal Journal Engineer, Inc., 50 Union Square, New
- Power—Power. \$2; single numbers 5c. Hill Pub. Co., 10th Av at 36th St, New York.
- Ry Age—Railway Age Gazette. \$5; single numbers 15c. Simmons-Boardman Pub. Co., Woolworth Bldg, New York.
- Ry Age (Mech ed)—Railway Age Gazette, me-chanical edition including the American Engi-neer. \$2; single numbers 20c. Simmons-Board-man Pub. Co., Woolworth Bldg, New York.
- Ry R—Railway Review. \$4; single numbers 15c. Railway Review, 1407 Ellsworth Bldg, Chicago; 30 Church St, New York. Formerly Railway and Engineering Review.
- Sch Mines Q—School of Mines Quarterly. \$1.50; single numbers 50c. School of Mines Quarterly, Columbia University, New York.
- Sci Am-Scientific American, \$3: single numbers 10c. Munn & Co., 361 Broadway, New York.
- Sci Am S—Scientific American Supplement. \$5; single numbers 10c. Munn & Co., 361 Broad-way, New York.

- Sibley J—Sibley Journal of Engineering. \$2; single numbers 25c. Sibley College, Cornell Univ., Ithaca, N. Y.
- Indicator. Stevens Ind-Stevens \$1.50; numbers 50c. Stevens Institute of Technology, Hoboken, N. J.
- Textile World—Textile World Journal, \$3 Bragdon, Lord & Nagle Co., 377 Broadway, New
  - Formerly published as Textile World Record, monthly at \$2
- U S Agric Bul—United States. Dept. of Agriculture. Bulletin, Distributed free of charge. U. S. Dept. of Agriculture, Division of Publitions, Washington, D. C.
  Contributions from the Bureau of Chemiscations.
  - Forest Service and Office of Public Roads
- U S Bur For & Dom Com-United States. Bureau of Foreign and Domestic Commerce. Special agents series. U. S. Bureau of Foreign and Domestic Commerce, Washington, D. C.
- S Bur Mines Bul—United States. Bureau of Mines. Bulletin. Distributed free of charge, U. S. Bureau of Mines, Washington, D. C.
- U S Bur Mines Circ—United States. Bureau of Mines, Miners' circular, U. S. Bureau of Mines, Washington, D. C.
- U S Bur Mines Tech Pa-United States. Bureau of Mines. Technical paper. U. S. Bureau of Mines, Washington, D. C.
- S Bur Stand Bul-United States. Bureau of Standards. Bulletin. Gratis to educational and scientific institutions and to government depositories. U. S. Bureau of Standards, Washington, D. C. ington, D. C.
  Sold to individuals by the Superintendent
  - of Documents. \$1; single numbers 25c.
- U S Bur Stand Circ-United States. Bureau of Standards. Circular. U. S. Bureau of Standards, Washington, D. C.
- U S Bur Stand Tech Pa—United States, Bureau of Standards, Technologic papers, U. S. Bureau of Standards, Washington, D. C.
- U S Sp Cons Rep—United States. Special consular reports. U. S. Bureau of Foreign and Domestic Commerce, Washington, D. C.
- W Soc E J—Journal of the Western Society of Engineers. \$3; single numbers 50c. Western Society of Engineers, 1735 Monadnock Blk, Chicago.
- Wis U Bul Eng S-Bulletin of the University of Wisconsin, Engineering Series. Univ. of Wis., Madison.

# Industrial Arts Index

# A Cumulative Index to Engineering and Trade Periodicals

January—December, 1915

Abattoirs. See Slaughtering and slaughter houses

Abbevs

Ancient abbey of St. Eloi, J. Alaux. il Am Inst Arch J 3:12-13 Ja '15

#### Aberdeen, South Dakota

#### Sewerage

Sewage disposal plant at Aberdeen, South Dakota; with discussion. W. G. Potter, il plans W Soc E J 19:788-805, pl 1-8 O '14; Same. Eng & Contr 43:37-8 Ja 13 '15; Same cond. Metal Work 84:214-17 Ag 13 '15

#### Water supply

Rectangular fire-service reservoir. W. G. Potter. il Eng Rec 71:260-1 F 27 '15

#### Abilene, Kansas

#### Politics and government

Results obtained at Abilene, in 16 months under commission-manager government. Riddle. Eng & Contr 42:503-4 N 25 '14

#### Ability

See also Efficiency, Industrial; Leadership

Ability tests

Measuring human intelligence: standardized tests used by the Public health service.

H. A. Knox. il Sci Am 112:52-3+ Ja 9 '15 H. A. Knox. il Sci Am 12:52-3+ Ja 9 '15 H. A. Knox. Mental tests of dementia. B. Hart a Spearman. Sci Am S 80:206-8 S 25 '15 and C.

New way of measuring mental ability. A. M. Jungmann, il diags Sci Am S 80:140-1 Ag

Selecting the right occupation, Eng N 74:321-2 Ag 12 '15

Teaching defective children, A. M. Jungmann. Sci Am 112:361 Ap 17 '15

Ablain St. Nazaire, France Church of Ablain St. Nazaire, J. P. Alaux, il Am Inst Arch J 3:337-8 Ag '15

Abrasive wheels. See Grinding machines; Grinding wheels

#### Abrasives

brasive for grinding steel; patented by H. T. Kalmus. Met & Chem Eng 13:762-3 O 15 '15 Abrasive

15 '15
Abrasive products at San Francisco fair. il Iron Tr R 57:487 S 9 '15
Abrasives; various kinds used in grinding and polishing. C. Hawke. Metal Ind n s 13:101-2, 148-50 Mr-Ap '15
Carborundum products, their manufacture and uses as abrasives and refractories. C. E. Hawke. Iron Age 96:1121 N 11 '15

C. E. Hawke. Iron Age 96:1121 N 11 '15
Grinding wheels for foundry use. C. F: Dietz.
Iron Tr R 57:314-18+ Ag 12 '15
Grinding wheels; history and description of
various abrasive compounds. W. C. Gold.
Metal Ind n s 13:450-2 N '15
Laps and lapping; abstracts. W. A. Knight
and A. A. Case. diags Am Soc M E J 37:
451-6 Ag '15; Iron Tr R 57:24-6 Jl 1 '15;
Mach 21:976-8 Ag '15; Discussion. Am Soc
M E J 37:456-8 Ag '15

See also Grinding and polishing Absolute zero. See Temperature, Low Absorbent cotton. See Cotton, Absorbent

#### Absorption

Absorption of glucose by bone-black, H. Morton, Am Chem Soc J 36:1832-8 S '14

Reagents for use in gas analysis; alkaline pyrogallol. R. P. Anderson. diag J Ind & Eng Chem 7:587-96 Jl '15

Specific absorption of reagents for gas analysis. R. P. Anderson. J Ind & Eng Chem 7:587 Jl '15

#### Academic freedom

Common sense regarding academic freedom. Eng ktec 72:35 Jl 10 '15 Common sense regarding academic freedom. J: W. Alvord. Eng Rec 72:176 Ag 7 '15

Measuring shocks of vehicles and vibrations of buildings: a means for investigating important traffic problems. A. Boyer-Guillon. il diags Sci Am S 78:364-5 D 5 '14

See also Aeronautics—Accidents; Automobile accidents; Collisions at sea; Railroads—Accidents; Shipwrecks; Street accidents; Subways—Accidents

#### Accidents, Industrial

Conditions of industrial accidents. Sci Am S 79:179 Mr 20 '15

Crane and chain accidents: abstract. Ind Eng 14:411-12 O '14

Explosives and accidents, Engineer 118:531-2 D 4 '14

Industrial accidents in Massachusetts. Sci Am

Industrial accidents in Massachusetts. Sci Am 112:433 My 8 '15 Intoxication, a cause of accidents. T: D. West. il Iron Tr R 56:713-16 Ap 8 '15; Same. Foundry 43:267-70 JI '15
Prevention of accidents in cotton mills. J: Calder. Textile World 49:622-4 S '15
Prevention of infection. T: Darlington. Iron Tr R 56:770 Ap 15 '15
Relation between accidents and inadequate lighting. Illum Engr 8:383-5 S '15
Safety in stone quarrying; typical accidents in quarries. O. Bowles. U S Bur Mines Tech Pa 111:43-6 '15
See also Boiler accidents: Boiler explose

See also Boiler accidents: Boiler See also Boiler accidents; Boiler explosions; Coal mines and mining—Accidents and explosions; Coke ovens—Accidents; Cranes, derricks, etc.—Accidents; Employers' liability; Explosions; First aid in illness and injury; Foundries—Accidents; Gas manufacture and works—Accidents; Metallurgical plants—Accidents; Mine accidents; Safety devices and measures; Workmen's compensation Workmen's compensation

#### Accountants

Countants
Contractual relations between clients and accountants. H. M. Temple. J Account 20: 291-6 O '15
Relations of accountants and engineers in special investigations of various kinds of plants. H. C. Hopson. J Account 20:397-9 N '15

#### Accountants, Public

Accountants and the public. H: D. Love. J Account 18:489-92 D '14 Accounting profession in the United States. J. E: Masters. J Account 20:349-55 N '15

Accountants, Public—Continued

Accounting profession; its demands and its future. E. W. Sells. J Account 20:325-33 N

Certified public accountants. W. H. Rand. J. Account 19:14-20 Ja '15
Competitive bidding. J. Account 20:81-90, 133-6, 365-6 Ag, N. '15
National aspects of public accountancy. J. Account 19:46-50 Ja '15
Phases of professional ethics. J: F. Forbes. J. Account 20:271-5 O '15
Will we co-operate or must we incorporate?
W. D. Whitcomb. J. Account 20:276-82 O '15

See also Accounting; American association of public accountants

#### Advertising

Educating the public. J Account 19:359-62 My

#### Examinations

C. P. A. examinations. S. Walton. J Account 19:230-42 Mr '15
How to pass the C. P. A. examinations. J. Hunter. J Account 20:34-7 Jl '15
Ohio state board of accountancy examination. J Account 19:65-71 Ja '15

Arkansas C. P. A. law. J Account 19:300-3

Indiana C. P. A. law. J Account 19:304-5 Ap

Iowa C. P. A. law. J Account 19:369-72 My '15 Kansas C. P. A. law. J Account 19:372-4 My

South Carolina C. P. A. law. J Account 19: 306-9 Ap '15 Texas C. P. A. law. J Account 19:375-80 My '15

Accounting

Accounting Accountant's report from the standpoint of the several parties at interest. J. S. M. Goodloe. J Account 20:91-103 Ag '15 Accounting for cement packages. G. Wilson. J Account 19:198-205 Mr '15 Accounting for depreciation. R. Sealy. Elec W 65:460-1 F 20 '15 Accounting system for contractors. Elec R & W Elec'n 66:152 Ja 23 '15 Consolidation of balance sheets in holding company accounting. A. W. Wright. J

company accounting. A. W. Account 19:21-33 Ja '15
Cooperative organization busines business

Account 19:21-33 Ja '15
Cooperative organization business methods.
W. H. Kerr and G. A. Nahstoll. bibliog U S
Agric Bul 178:1-24 '15
Credits from the viewpoint of a certified public accountant. F: H. Hurdman. J Account
18:435-54 D '14
Department store accounts. H: C. Magee. J
Account 19:268-91 Ap '15
Depreciation accounts. W. H. Lawton. Elec
W 65:1678-9 Je 26 '15
Depreciation problems. H. Erickson. Am Gas
Inst Pro 9:pt 2, 1582-1638; Discussion. 9:
pt 2, 1638-82 '14
Federal trade commission and accounting.
J Account 20:129-33 Ag '15
Importance of accrued accounts. J: F.
Forbes. Elec Ry J 46:809-10 O 16 '15
Inter-department profits. S. Walton. J Account
19:154-8 F '15
Library for accounting employees. Elec Ry
J 46:953 N 6 '15
Overissuing capital stock. J Account 19:62-5
Ja '15
Beture of annual net income by corporations

Ja '15

Return of annual net income by corporations. W. F. Weiss. J Account 19:260-7 Ap '15 Scope of accountancy. J Account 19:456-8 Je

Secret reserves. J. P. Joplin. J Account 18:  $407\text{--}17\ \mathrm{D}$   $^{1}14$  Sub-division, saving and safety. Horseless Age  $34\text{:}869\text{--}70\ \mathrm{D}$  16  $^{1}14$ 

ub-division, 34:869-70 D 16 '14

See also Accountants, Public; Auditing Banks and banking—Accounting; Building—Accounting; Business; Card system in Accounting; Business; Depreciation

Financia Auditing: Banks and banking—Accounting; Building—Accounting; Business; Card system in business; Cost accounting; Depreciation; Electric railroads—Accounting; Financial statements; Foundry accounting; Gas companies—Accounting; Highway accounting; Interest; Inventories; Mine accounting; Municipal accounting; Partnership; Plumbing trade—Accounting; Power plants—Accounting; Public service corporations—Accounting; Public services counting; Public service corporations-Accounting; Railroads—Accounting; accounting; Waterworks—Accounting School

#### Societies

Accountancy in Canada. G: Edwards. J Account 20:334-48 N '15
Accounting profession in the United States.
J. E: Masters. J Account 20:350-2 N '15

#### Terminology

Words often used incorrectly, S. Walton, J Account 20:385-6 N '15

#### Canada

Accountancy in Canada. G: Edwards. J Account 20:334-48 N '15

Accountant in the Orient, E. S. Fischer, J Account 20:356-60 N '15

Accumulators. See Storage batteries

Accumulators, Steam. See Steam accumulators Acetate of lime. See Lime acetate

Acetic acid

Jindicator in pyroligneous acid. J. M. Johlin.
Jind & Eng Chem 7:596 Ji '15
Production of acetone from pyroligneous acid.
M. Darrin. il Jind & Eng Chem 7:927-9

Acetic anhydride
Action of acetic anhydride on some benzylidene anthranilic acids. J: B. Ekeley and C: F. Poe. Am Chem Soc J 37:582-6 Mr '15

Acetolysis Acetolysis of carbohydrates. S. Born and J. M. Nelson. Am Chem Soc J 37:1763-9 JI '15

Acetone

Production of acetone from pyroligneous acid. M. Darrin, il J Ind & Eng Chem 7:927-9 M. D N '15

Acetylacetone-thiourea Constitution of acetylacetone-thiourea, W: J. Hale and A. G. Williams, Am Chem Soc J 37:594-600 Mr '15

Acetylene

Acetylene-oil-gas generating outfit. il Mach 21:513-14 F '15

21:513-14 F '15
Action of acetylene on metals, A. C. Morrison. Sci Am 113:487 D 4 '15
Dissolved and self-generated acetylene. M. K. Dunham. Iron Age 96:351-3 Ag 12 '15
Effect of acetylene on metals. Sci Am 113:
408 N 6 '15
Explosibility of acetylene. G: A. Burrell and G. G. Oberfell. U S Bur Mines Tech Pa 112:1-12 '15
Ulumination of the suburban house, the use

Illumination of the suburban house; the use of electricity or acetylene, H. L. Alt. diags Brickb 24:251-2 O '15

Oxy-acetylene welding and cutting equipment; acetylene generators, S. W. Miller, diags Mach 22:92-4 O '15

Properties of acetylene C<sub>2</sub> H<sub>2</sub>. Colliery 35:262

apor pressures of acetylene, ammonia and isobutane at temperatures below their nor-mal boiling points. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:2482-6 N '15 Vapor

Why acetylene is the combustible gas used for autogenous welding. M. K. Dunham, Mach 21:1017-18 Ag '15

See also Oxyacetylene flame

Acetylene, Substitutes for New competitor of acetylene. J. F. Springer. Mach 21:903 Jl '15

Possible substitute for acetylene in welding and cutting; by-product of natural-gas gasoline. J. F. Springer. Ry Age (Mech ed) 89:529-30 O '15

Acetylene burners

New standard light source. L. A. Jones, Am Gas Light J 101:251-3 O 19 '14; Same, Illum Eng Soc 9:716-27; Discussion, 9:728-33 no 8 '14

Acetylene flame. See Oxyacetylene flame

Acheson, Edward Goodrich

Silica, coke, sawdust and salt; career of E: G. Acheson and inventions of carborundum. C. F. Williams, pors Iron Tr R 56:457-8 Mr 4 '15

Acid fumes Removing acid fumes by blower system method. W. E. Piper, diag Metal Work 84: 682-3 N 26 '15 cidimetry. See Volumetric analysis

Acidity Acidity and ash of vanilla extract. A. L. Winton, A. R. Albright and E. H. Berry. J Ind & Eng Chem 7:516-19 Je '15
Rate of reduction of acidity of descending waters by certain ore and gangue minerals and its bearing upon secondary sulphide enrichment. G. S. Nishihara, il Econ Geol 9: 743-57 D '14

Influence of temperature in acid catalysis.
H. S. Taylor. Am Chem Soc J 37:551-7 Mr

See also names of acids, e. g. Nitric acid, Sulphuric acid

Acids, Fatty
Absorption and the surface tension of aqueous

Absorption and the surface tension of aqueous solution of homologous fatty acids and alcohols. M. Neidle. Am Chem Soc J 37: 513-15 Mr '15

Action of finely divided silver on a-bromo- and a-iodopalmitic acids: synthesis of two isomeric ditetradecylsuccinic acids. D. B. Jones. Am Chem Soc J 37:586-94 Mr '15

Determination of the total fatty acids and other ether-soluble constituents of feedstuffs. J. B. Rather. J Ind & Eng Chem 7:218-20 Mr '15

Effect of free fatty acids upon the flash and fire points of animal fats and oils. A. Lowenstein and J. J. Vollertsen. J Ind & Eng Chem 7:850 O '15

Influence of hydroxy acids and lactones upon determination of the chemical constants of fatty acids. C. A. Browne. J Ind & Eng Chem 7:30-4 Ja '15

Organic Acids, Addition compounds of organic acids in pairs, J. Kendall, Am Chem Soc J 36:1722-34 Ag '14

34 Ag '14
Preliminary study of the conductivity of certain organic acids in absolute ethyl alcohol at 15°, 25° and 35°. E. P. Wightman, J. B. Wiesel and H. C. Jones. diags Am Chem Soc J 36:2243-59 N '14

Acorus calamus, L.
Chemical and physical properties of oils distilled from the various parts of the plant acorus calamus, L. G. A. Russell. Am Chem Soc J 37:2387-94 O '15

Acoustics, Architectural

Acoustics, Architectural
Acoustics of auditoriums. T. E. Phillips. Sci
Am 112:289 Mr 27 '15
Acoustics of auditoriums; investigation of the
acoustical properties of the auditorium at the
University of Illinois. F. R. Watson. bibliog
il Ill U Eng Exp Sta Bul 73:1-32 '14; Same.
Sci Am S 78:358-9, 380-2 D 5-12 '14
Acoustics of auditoriums; investigation of the
acoustical properties of the armory at the
University of Illinois. F. R. Watson. il
Brickb 24:257-8 O '15
Architectural acoustics W. C. Sabine, il J. Fr.

Architectural acoustics. W. C. Sabine. il J Fr Inst 179:1-20 Ja '15

Insulation of sound, W. C. Sabine, diags Brickb 24:31-6 F '15

See also Architecture

Acridine Salts of acridine, pyridine and quinoline. L. H. Cone. Am Chem Soc J 36:2101-10 O '14

Acrolein Preparation of acrolein. E. J. Witzemann. diag Am Chem Soc J 36:1766-70 Ag '14

Actinometer Features of photo-chemistry. H. H. McHenry. Sci Am S 79:27 Ja 9 '15

Activated sludge. See Sewage aeration

Addicks, Lawrence, 1878-Sketch. por Eng M 50:205 N '15 Adding machines. See Calculating machines

Addition compounds

Addition compounds of aldehydes and ketones with organic acids. J. Kendall and W. A. Gibbons. Am Chem Soc J 37:149-62 Ja '15

ddition compounds of organic substances with sulfuric acid, J. Kendall and C. D. Carpenter. Am Chem Soc J 36:2498-517 D

Triphenylmethyl; the additive compounds of triphenylmethyl and some saturated hydro-carbons. M. Gomberg and C. S. Schoepfle. Am Chem Soc J 37:2569-74 N '15

#### Adhesives

See also Glue

Adjustable wedge stop in jig and fixture design. R. E. McCoy. diags Mach 21:895-9 Jl '15

Adrenal gland
Therapeutic uses of preparations of the duct-less glands. R. G. Torrey. Sci Am S 80:122 Ag 21 '15

Adsorption

Neutralization of adsorbed ions. W. D. Ban-croft. Met & Chem Eng 13:318-19 My '15

Advertisements

dvertisements
Advantages of hand-lettering. A. G. Brenton.
Inland Ptr 55:753-6 S '15
Advertisement-writer runs wild. J; H. Clayton. Inland Ptr 55:797-8 S '15
Advertising for printers. J. L. Frazier. Inland
Ptr 54:513-16 Ja '15
Mechanical make-up of a circular. Horseless
Age 35:331-2 Mr 10 '15
Preparing copy for circulars. Horseless Age
35:298-9 Mr 3 '15
Printers' blotters. Inland Ptr 55:784a-784h S
'15

Review of newspapers and advertisements. J. L. Frazier. See monthly numbers of Inland printer Service to the advertiser. B. O. Brown. Inland Ptr 56:329-32 D 15 Try-outs in sales-making printing. J: H. Clayton. Inland Ptr 55:693-6 Ag 15 Word and the printer. J: H. Clayton. See monthly numbers of Inland printer See also Advertising

Advertising and selling. T. M. Ambler. Am Gas Light J 103:60-1 Jl 26 '15 Advertising and selling methods for concrete drain tile manufacturers. J. J. Commons. Concrete Cem 7:27-8 Jl '15 Advertising car in Boston. il Elec Ry J 46:

Auvertising service of the weekly. Inland Ptr 55:475-7 J1 '15 Boosting the advertising patronage in a local paper. C. L. Chamberlin. Inland Ptr 55:761-5 S '15

5 S '15
Business methods for the plumber and fitter.
W. A. Fink. Dom Eng 69:331-2; 70:42-3, 103, 369; 71:34-5, 101-2 D 12 '14, Ja 9, 23, Mr 20, Ap 10, 24 '15
Conflict between news and advertising. J. C. Morrison. Inland Ptr 54:681-4 F '15
Indirect advertising by the Frank H. Stewart electric co., Philadelphia, il Elec W 65:865
Ap 3 '15 years and aggressive sales seekers il

Ap 3 15
Manufacturers and aggressive sales seekers. il
Metal Work 83:14-25 Ja 1 '15
Printed matter distribution. C: Fried. Inland
Ptr 54:350-1 D '14
Supervision of postage stamps. Horseless Age
35:262 F 24 '15
Unconscious humor in advertising. A. C.
Woodbury. Horseless Age 35:479-80 Ap 7 '15
Under-advertising of the steel business.
G: H. Jones. Eng M 50:357-63 D '15; Same
cond. Iron Age 96:1025-7 O 28 '15
Using newspapers to build business. Metal
Work 83:61-5 Ja 1 '15
Value of advertising. A. Williams. il Elec W
65:1001-2 Ap 17 '15
See also Advertisements; Business; Cata-

See also Advertisements; Business; Catalogs; Electric service companies—Advertising; Electric signs; Posters; Sales letters; Salesmen and salesmanship; Show windows

#### Rates

Chaos of legal rates. J. C. Morrison. Inland Ptr 55:385-6 Je '15 Ideal rate-card. J. C. Morrison. Inland Ptr 54: 401-3 D '14 Legal advertising and legal rates. J. C. Morrison. Inland Ptr 55:539-41, 683-6, 809-10 Jl-S '15

Advertising clubs of the world, Associated. See Associated advertising clubs of the world

Aeration of sewage. See Sewage aeration

Aeration of water, See Water aeration

Aerial photography. See Photography, Aerial

Aerial tramways. See Cableways

ial warfare. See Aeronautics, European war—Aerial operations Aerial warfare.

Aero-electric plant. See Electric plants

Aero pulverizer

Economy of powdered fuel. il Eng M 48:sup4-6

Aerodynamic laboratories

European aeronautical laboratories; their or-

European aeronautical laboratories; their organization, equipment and methods of investigation. A. F. Zahm. il Sci Am S 79: 328-30, 340-2 My 22-29 '15

New aerodynamical researches. G. Eiffel. il Sci Am S 80:260-1 O 23 '15

Scientific aeronautic research; the new aerodynamic laboratory of the Massachusetts institute of technology. J. C. Hunsaker. il Sci Am S 79:364-5 Je 5 '15

#### Aerolites. See Meteorites

Aeronautics

Aeronautics
Aeronautics in 1914: Engineer 119:6-8 Ja 1 '15;
Excerpts. Sci Am S 79:114-15 F 20 '15
'New aerodynamical researches. G. Eiffel. il
Sci Am S 89:260-1 O 23 '15
Review of the year 1914: aeronautics. Sci Am
112:7 Ja 2 '15
Scientific aeronautic research; the new aerodynamic laboratory of the Massachusetts
institute of technology, J. C. Hunsaker. il
Sci Am S 79:364-5 Je 5 '15
Using air for ballast. R. H. Upson, Sci Am S
80:142 Ag 28 '15
See also Aerodynamic laboratories; Aeroplane motors; Aeroplanes; Balloons and air-

plane motors; Aeroplanes; Balloons and airships; Flying boats; Hydroplanes

#### Accidents

Another aviator perishes: Lincoln Beachey. Sci Am 112:288 Mr 27 '15 How Lieut. Gerstner perished, G: P. Scriven. Sci Am 112:217 Mr 6 '15

Signals Communicating with aircraft, Sci Am S 80: 355 D 4 '15 Signaling apparatus used by airships. il Sci Am 113:265 S 25 '15

Aeronautics, Military

Aeronautics, Military

Aerial range-finding with electrical ears. il
Sci Am 113:377 O 30 '15

Aerial scouting, H. Bannerman-Phillips. Eng
M. 50:101-3 O '15

Aerial warfare and the weather. map Sci
Am S 80:259 O 23 '15

Aeronautic lessons of the European war.
C. Dienstbach, il Sci Am 112:627+ Je 26 '15

Aeronautics in 1914. Engineer 119:7-8 Ja 1
'15; Excerpt, Sci Am S 79:114 F 20 '15

Aeroplane darts and fire darts. il Sci Am S
79:124 F 20 '15

Aircraft artillery and bomb-dropping. C.
Dienstbach, il Sci Am 112:126 F 6 '15

Aircraft artillery and bomb-dropping, C. Dienstbach, il Sci Am 112:126 F 6 '15
Airship in the field, il Sci Am S 79:200 Mr 27

American aeroplanes for warfare, O. A. Dickinson, il Eng M 49:641-61 Ag '15
Captive balloons on the French front, N. Truslow, Sci Am 113:181 Ag 28 '15
Communicating with aircraft, Sci Am S 80:

355 D 4 '15

European war from an engineer's standpoint. J: B. C. Kershaw. il diags Eng M 48:498-507 Ja '15

Ja 15 Flying machines of the warring powers. J; J. Ide. diags Sci Am 112:226-7+ Mr 6 '15 Government's competition for a naval dirigible. C. Dienstbach. Sci Am 112:405 My 1 '15 Gun and the aeroplane. B. Young. il Sci Am S 80:276 O 30 '15 Gyrotelescope. C. Dienstbach. il Sci Am 113:

Gyrotelescope. C. Dienstbach. il Sci Am 113: 363+ O 23 '15 How the war has modified the aeroplane. L. d'Orcy. il diags Sci Am 113:196-7+ S L.,15

flight over the enemy. Sci Am 111:481 D 5

Mechanical aids for air scouts. il Sci Am 112:175 F 20 '15 Military value of airships. Sci Am 112:94 Ja

ov first naval dirigible, C. Dienstbach, il Sci Am 113:44 Jl 10 '15 Recent progress in military aëronautics, S: Reber, J Fr Inst 180:437-48 O '15

Shells for destroying airships, il Sci Am 112: 161 F 13 '15
Signaling apparatus used by airships, il Sci Am 113:265 S 25 '15
Steel darts, Sci Am 112:156 F 13 '15
Torpedo attack from the air, Sci Am 111:523

14 D 26 Tise

D 20 13 ise of balloons during the siege of Paris, 1870-1; table and charts showing number of ascensions and results. Sci Am S 80:229 0 9 '15

War experiences of an air scout. F: C. Hild. il Sci Am 111:520+; 112:20+, 51+ D 26'14-Ja

Zeppelin. Sci Am 113:8 Jl 3'15 Zeppelin and aeroplane raids. Engineer 120: 265-6 S 17'15

See also European war—Aerial operations; Military reconnaissance

#### Aeronauts. See Aviators

Aeroplane factories
Where wings are made for fighting men.
F: Eppelsheimer. il Sci Am 113:204-5 S 4 '15

Aeroplane motors

Aeroplane engines; requisites and details of design. N. MacCoull, jr. Sci Am S 80:250-1 O 16 '15 Big eight for aeroplanes. il Automobile 32; 469 Mr 11 '15

Dual aeronautical motors. diag Engineer 118: 132 Jl 31 '14; Same. Sci Am S 78:395 D 19 Dual-engined aeroplanes, Sci Am 111:461 D 5

'14
French plants make V motors. W. F. Bradley. il Automobile 33:729-33 O 21 '15
History of the twelve-cylinder motor. E. W. Walford, il Automobile 32:500-1 Mr 18 '15
Progress in the construction of aeroplanes.
N. MacCoull, jr. Horseless Age 35:803-4 Je 16 '15

Renault aviation twelve possibly for cars. Automobile 33:454 8 9 '15 Twin-six engines for aeroplanes. F: Eppel-sheimer. il Sci Am 113:421+ N 13 '15

Aeroplane stability and stabilizers
Gyrotelescope. C. Dienstbach. il Sci Am 113: Gyrotelescope, C 363+ O 23 '15

Aeroplanes

Aeronautical timber; abstract. J. E. Huson. Am Soc M E J 37:712 D '15 Aeronautics in 1914. Engineer 119:6-7 Ja 1 '15; Excerpt. Soi Am S 79:114-15 F 20 '15 Albessard aeroplane. il Sci Am 112:384 Ap 24

American aeroplanes for warfare. O. A. Dickinson. il Eng M 49:641-61 Ag '15
Evolution of the Etrich taube; how a seedpod was developed into an aeroplane. diags Sci Am S 79:284-5 My 1 '15
Flying machines of the warring powers. J: J. Ide. diags Sci Am 112:226-7+ Mr 6 '15
How the war has modified the aeroplane.
L. d'Orcy. il diags Sci Am 113:196-7+ S 4

Hulls for aeroplanes; abstract. H. C. Richardson. diags Am Soc M E J 37:291-3 My '15 Italian military aeroplanes. J: J. Ide. diags Sei Am S 79:301 My 8 '15

Lincoln Beachey monoplane; details of a com-posite design that failed from weakness, diags Sci Am S 79:237-8 Ap 10 '15

New type of areoplane; an even keel flyer. T: A. E. Lake. il diags Sci Am S 80:4-5 Jl T: A

Thomas military tractor biplane, il Sci Am S 79:254 Ap 17'15

Wing data and analysis for a staggered biplane. A. F. Zahm. diags J Fr Inst 178:663-79 D '14; Abstract. Am Soc M E J 37:56-7 Ja '15

Aeronautics; Aeroplane motors; See also Hydroplanes

#### Aeroplanes -Continued

Equipment

Chest telephone for aeroplane pilots, il Sci Am 113:255 S 18 '15; Elec R & W Elec'n 67:211-12 Jl 31 '15 Instruments used on aeroplanes. Sci Am S 80:23 Jl 10 '15

eroscope
Aeroscope a novel feature of Panama-Pacific
exposition, il Eng Rec 71:423 Ap 3 '15
Aeroscope at the Panama-Pacific exposition.
il Elec Ry J 46:31-2 J1 3 '15
Anchored airship: structural amusement device weighing 620 tons, il Iron Age 95:184
Ja 21 '15
Joy riding in the sky, il Sci Am 112:344 Ap
10 '15

#### Afghanistan

#### Commerce

British India, il U S Sp Cons Rep 72:533-60 '15

See also Commercial law; Contracts
Agitators, See Dorr agitators; Trent agitators Agricultural chemistry

Effect of certain organic compounds on wheat plants in the soil. F. W. Upson and A. R. Powell. il J Ind & Eng Chem 7:420-2 My '15 See also Ammonia; Fertilizers and man-

ures; Soil analysis; Soils

Agricultural education

Agricultural education in Prussia—the German ideal. Am Ind 15:23 Jl '15
Agricultural instruction for the millions. Sci
Am 113:461 N 27 '15

Agricultural exhibitions

Royal agricultural show at Nottingham. Engineer 120:8-10, 30-1, 58-9 Jl 2-16'1

Agricultural machinery
British India; farm-implement trade. U S Sp
Cons Rep 72:336-53 '15

Farm machinery association inquiry. Iron Age 95:992 My 6 '15 Milling the soil; improving on the old-fashioned plow. L. W. Ellis, il Sci Am 112:436 My

Progress in small farm tractors. L. W. Ellis. il Sci Am 112:306-8 Ap 3 '15
Royal agricultural show at Nottingham. il diags Engineer 120:58-9 Jl 16 '15
Small farm tractors. Sci Am 112:304 Ap 3 '15
Smithfield club show. il diag Engineer 118:551-3
D 11 '14
Sec also Motor plays: Tractors.

See also Motor plows: Tractors

#### Manufacture

Electricity in implement manufacturing. W. J. Kyle. il Elec R & W Elec'n 67:97-101 Jl 17 '15

Agricultural pests
Snakes and their value to the agriculturist
R. W. Shufeldt. il Sci Am S 80:344-5 N 27 '15

Agriculture

New internationalism in agriculture. H. C. Price. Sci Am S 80:109 Ag 14 '15

See also Clearing of land; Demonstration farms; Drainage; Electricity on the farm; Ensilage; Farm buildings; Feeding and feeding stuffs; Fertilizers and manures; Forage plants; Forests and forestry; Irrigation; Plant breeding; Reclamation of land; Seeds; Silos; Soils and headings beginning Soil; Trees; Woodlots; also headings beginning Agricultural, and names of special products

Accounting

Cost of producing farm crops. O. R. Martin. J Account 19:245-59 Ap '15

#### Chile

That farm. Eng & Min J 99:275-6 F 6 '15

#### Germany

Agriculture in Germany and significant facts about potash. Sci Am S 80:167 S 11 '15

German agriculture in war time. Sci Am 112: 216 Mr 6 '15

#### India

British India; principal crops. U S Sp Cons Rep 72:318-35 '15

#### Palestine

Farming in Palestine. E. F. Beaumont. il Sci Am 113:162-3 Ag 21 '15

#### United States

Does irrigation pay? F. H. Newell. Eng Rec 72:384-5 S 25 '15 Growing hemp in America. C: R. Dodge. il Sci Am S 79:308-9 My 15 '15

Electric strength of air. J. B. Whitehead. Am Inst E E Pro 34:843-65 My '15; Discussion. 34:2997-3005 D '15

34:239(-3005 D 10) Larger ions in the air. J. A. Pollock. Sci Am S 80:75 Jl 31 '15 Properties of saturated air. W. D. Ennis. Power 41:402-4 Mr 23 '15

See also Aeronautics; Argon; Atmosphere; Atmospheric pressure; Compressed air; Humidity; Ionization; Liquid air; Mine air; Oxygen; Ozone; Ventilation; also Air conditions; Air flow, and other headings beginning Air

#### Analysis

Determination of gasoline vapor in air, G. A. Burrell and I. W. Robertson, diag J Ind & Eng Chem 7:112-13 F '15
Dust and bacteria content of city air, M. C. Whipple. Heat & Ven 12:27-33 S '15
Exact determination of sulphur dioxide in air, J. R. Marston, Eng & Min J 100:726-7
O 30 '15

Air, Compressed. See Compressed air

Air, Liquid. See Liquid air

Air brake association

or brake association 22d annual convention, Chicago, May 4-7. diags Ry Age (Mech ed) 89:295-9 Je '15 22d annual convention, Chicago, May 4. Ry R 56:630-3 My 8 '15 22d annual convention, Chicago, May 4-7. Ry Age 58:1015-17 My 14 '15

Air brake hose

Conservation and protection of air brake hose. Ry R 56:303-5 Mr 6 '15 Subers process. il Ry Age (Mech ed) 89:484 S

Air brakes

Air brakes
Air brake association convention, diags Ry
Age (Mech ed) 89:295-9 Je '15
Air brake association 22d annual convention,
Ry Age 58:1015-17 My 14 '15
Air brake association 22d annual convention,
Ry R 56:630-3 My 8 '15
Air cooling plant, New York Central R. R.,
Mott Haven yard, New York, M. Purcell and
M. F. Gannon, il plans Ry R 56:703-5 My 22
'15
Diarphagam county in the server of th

'15
Diaphragm-operated triple valve, diags Ry
Age (Mech ed) \$9:92-4 F '15
Electric-air brake adopted by Pennsylvania
R. R. Eng N 73:627 Ap 1 '15
Electro-pneumatic brake, W. V. Turner, Ry
Age 59:511 S 17 '15; Same, Ry Age (Mech
ed) \$9:507-8 O '15
Handling of the air brakes, Ry Age (Mech
ed) 89:509-10 O '15
Improvement in the handling of air brakes on
modern trains, Ry R 57:360-1 S 18 '15
Inspection and maintenance of air brakes on
freight cars, R. Barnaby, Ry Age (Mech ed)
89:406 Ag '15
One hundred per cent operative brakes in

89:406 Ag '15
One hundred per cent operative brakes in freight service. G: H. Wood and S. C. Wheeler, map Ry R 57:54-7 Jl 10 '15
Westinghouse electro-pneumatic air brake on the Pennsylvania railroad. H. T. Wade, il plan Sci Am 112:594 Je 12 '15

See also Air brake association: Air brake hose

Testing

Testing devices for air brakes, diags Ry Age (Mech ed) 89:470 S '15

Air brush painting. See Painting, Industrial

Air compressors

Air-compressor cooling with water barrels. J. Simmons, il Eng & Min J 100:189 Jl 31 '15 Air compressor for prospecting. il Eng & Min J 100:844 N 20 '15

Air compressor of the portable type, il Iron Age 96:1104 N 4 '15

Air compressors—Continued
Air compressor valve of steel strips, il Iron
Age 95:1010 My 6 '15
Choosing air compressors for activatedsludge tanks, C. H. Nordell, Eng N 74:9046 N 4 '15

sludge tanks. C. H. Nordell. Eng N 74:904-6 N 4 '15
Cold-air intake duct for air compressors. R. S. Bayard. Power 41:715-16 My 25 '15; Same. Eng & Min J 100:13-14 Jl 3 '15
Combined air compressor and vacuum pump. il diags Engineer 119:143 F 5 '15
Compressor for light-weight, low-floor cars. il diags Elec Ry J 46:681 O 2 '15
Cylinder ratios for air compressors. F. W. Salmon. Power 41:472-3 Ap 6 '15
De Laval high speed blower and centrifugal air compressor. il diag Ry Age (Mech ed) 89:374-6 Jl '15; Iron Age 96:136-7 Jl 15 '15; Power 42:147 Ag 3 '15
Description of air compressor in the plant of the Nungesser carbon & battery co., Cleveland. il Met & Chem Eng 13:460-1 Jl '15
Efficiency of air compressors and the measurement of air flow. J. H. Rider. Eng & Min J 99:1118 Je 26 '15
Forty-million-revolution compressor-valve test. il Power 41:537-8 Ap 20 '16
Friction loss in air compressors. Sibley J 29: 195-6 Mr '15
Graphical tables for calculating reciprocating compressors: abstract. Immerschitt. Am Soc

Graphical tables for calculating reciprocating compressors; abstract. Immerschitt. Am Soc M E J 37:553-4 S '15

How one operator controlled an air-compressor motor and used it to drive a direct-current generator. H. R. Smith. diags Elec W 66:468

Imperial portable air compressor. il Power 41:

Imperial portable air compressor. Il Power 41; 86 Ja 19 '15
Ingersoll-Rand high efficiency air compressor.
il Power 41:888 Je 29 '15; Eng & Contr 43: 524-5 Je 9 '16; Iron Age 95:1296-7 Je 10 '15; Iron Tr R 56:1116 Je 3 '15
Investigation of a gas driven air compressor plant at the mine Consolidation, Am Soc M E J 37:112-13 F '15
Isokson rotary air compressor il Eng & Min

J 37:112-13 F '15
Jackson rotary air compressor, il Eng & Min
J 100:643 O 16 '15
Molding air compressors on jolt-rammers. il
Foundry 43:18-19 Ja '15
New volume regulator for air compressors;
with discussion. R. Wikander. diag Am Soc
M E J 37:170-4 Mr '15
New York tunnel power plants. il plans Eng
N 74:700-1 O 7 '15

N 74:700-1 O 7 '15
Palmetto packing for air compressors. il Int
Marine Eng 20:374 Ag '15
Plate valves for high-speed air compressors.
G. J. MacFadden. diags Power 41:366-8 Mr
16 '15; Same cond. Eng M 49:260-1 My '15
Points about air-compressor practice. R. H.
Rowland. Power 42:187-90 Ag 10 '15
Portable gasoline-engine air-compressors. il
Eng N 73:126 Ja 21 '15; Eng & Min J 99:
241 Ja 30 '15
Turbo-blowers and turbo-compressors. O. H.

Turbo-blowers and turbo-compressors. O. I Wunderlich, Power 42:280 Ag 24 '15 Two-stage single cylinder compressor; al stract. diag Am Soc M E J 37:342-3 Je '15

See also Air pumps; Compressed air

#### Testing

esting of air compressors. C. E. Davies. diag Engineer 119:622-3 Je 25 '15 Testing

Air conditions

Air conditions
Air conditioning; abstract. J. I. Lyle. Am Soc M E J 37:296 My '15
Air conditioning in a moving picture laboratory. il plans Heat & Ven 12:20-6 F '15
Air ozonation. M. W. Franklin. J Ind & Eng Chem 6:850-5 O '14; Same; with discussion. Am Soc Heat & V E 20:337-64 '14
Air we breathe—a study of temperature, humidity and dust content. T: Hubbard. Heat & Ven 12:22-5 Ja '15
Dust and bacteria content of city air. M. C. Whipple. Heat & Ven 12:27-33 S '15

Measure of comfort in factories; construction and use of the katathermometer. J. A. Sea-ger. il Heat & Ven 12:24-7 S '15

More about pure air. Metal Work 83:150 Ja 22 '15 New York state commission on ventilation: high temperatures have marked physiological effect. Elec Ry J 44:1330 D 19 '14

Physiological effect of natural gas. G. A. Burrell and G. G. Oberfell. U S Bur Mines Tech Pa 109:15-19 '15; Same. Sci Am S 80: 303-4 N 6 '15 
Progress of laboratory experiments with air. F: S. Lee. Metal Work 84:338-9+ S 10 '15 
Regulating temperature and humidity in

Regulating temperature and humidity in appraising cotton goods, il diag plan Textile World 48:389-2 Ja '15
Relation of ventilation to bodily health, T: R. Crowder, Metal Work 84:116-17 Jl 23 '15
Results of physiological and psychological observations during the first year's experiments: abstract, D. D. Kimball and G: T. Palmer. Power 41:177 F 2 '15
Savo air moistener, il Heat & Ven 12:52-3 S '15

Studies in air cleanliness. G: C. Whipple and M. C. Whipple. Heat & Ven 12:23-8 Jl '15 See also Air purification; Cooling; Dust prevention; Dust removal; Humidity; Smoke prevention; Ventilation

Air ducts. See Air pipes

Air engines

Hot-air engine. C: E. Duryea. il Sci Am 113: 165+ Ag 21 '15 Using a pneumatic drill motor as a hoisting engine. V. T. Kropidlowski, diag Ry Age 59:960 N 19 '15

See also Compressed air

Air filters

Air cleaning apparatus for the ventilation of generators and transformers. W: Baum. il diags Gen Elec R 18:801-12 Ag '15 Air filters for turbo-generators. il diags Engi-neer 119:21-2, 36-7, 81-3 Ja 1-8, 22 '15

See also Air washers

Air flow

Action of an air jet on the surrounding air; abstract. T. Trüpel. Am Soc M E J 37:283-5

My '15 Best way to take anemometer readings: com-mittee report. Am Soc Heat & V E 19:202-7

Efficiency of air compressors and the measurement of air flow, J. H. Rider. Eng & Min J 99:1118 Je 26 '15
Flow of air and steam through orifices. A. L. Westcott. diag Power 42:515-16 O 12 '15
Flow of air in heating and ventilating ducts, including an example in duct design. L. A. Harding. Am Soc Heat & V E 19:219-27 '13
Frictional losses in elbows and ducts. C: A. Fuller. diags Metal Work 84:371-2 S 17 '15
Lecture course on elements of heating. C: A. Fuller. Metal Work 81:34-5; 83:574-6, 703-5
Ja 2 '14, Ap 16, My 14 '15
Loss of pressure due to elbows in the transmission of air through pipes or ducts. F. L.

Loss of pressure due to enlows in the trans-mission of air through pipes or ducts. F. L. Busey, Am Soc Heat & V E 19:366-76 '13 Measurement of air flow; abstract. A. K. Ohmes, Am Soc M E J 37:347 Je '15; Dis-cussion, E. V. Hill, Heat & Ven 12:37-8 O

Simplified graphical or analytical process for the determination of dimensions of pipes in ventilating and heating installations; ab-stract. Brabbée and Bradtke. Am Soc M E J 37:552-3 S '15

Standardization of the use of the Pitot tube: report of committee, diags Am Soc Heat & E 20:210-15 '14

See also Anemometers; Gas flow; Steam flow

Air lifts

Air-lift efficiency, E. M. Ivens. diags Power 41:843-6 Je 22 '15 41:843-6 Je 22'15

Air lift pumping. P. H. Berggreen. Sibley J. 29:269-71 My '15; Abstract. Met & Chem. Eng 13:507 Ag '15

Air-lift pumps as a central-station load. diag. Elec R & W Elec'n 66:1191-2 Je 26'15

Draining a swamp by air lifts. Eng & Min. J. 100:402 S 4'15

Installation and operation of air lift pumping systems. C. M. Wetherill. Eng & Contr. 43: 422-3 My 12'15

Proper installation of air lift.

installation of

roper installation of air lift pumps. A. H. Ford. Eng & Contr 43:238-9 Mr 17 '15 umping water by compressed air. G. C. Thompson. diag Am Gas Light J 102:251-2 Ap Pumping

Air lifts -Continued

Trouble with an air lift, E. M. Ivens, diag Power 40:890-1 D 22 '14

Air liquefaction. See Liquefaction of gases

Air meters

See also Anemometers; Compressed air meters

Air permeability of building materials; abstracts. H. von Thielmann. Am Soc M E J 37:477-8 Ag '15; Heat & Ven 12:44-5 S '15

Air pipes

ir pipes
Canvas air duct in tunneling. Eng.
Jl 22 '15
Flow of air in heating and ventilating ducts, including an example in duct design. L. A.
Harding. Am Soc Heat & V E 19:219-27 '13
Loss of pressure due to elbows in the transmission of air through pipes or ducts. F. L.
Busey. Am Soc Heat & V E 19:366-76 '13

Air pumps

Cleaning air pumps. W. E. Johnson, plan Ry Age (Mech ed) 89:82 F '15
Device for placing air pumps. W. S. Whitford, il Ry Age (Mech ed) 89:581-2 N '15
High vacuum reciprocating air pump, diag Engineer 118:563 D 11 '14
Modern power-house condensing plant. A. Arnold, Inst E E J 53:848-50 Je 15 '15
Oiling air pump air cylinders. E. A. Murray, diag Ry Age (Mech ed) 89:408 Ag '15
Reboring air pump cylinders. J. A. Jesson, diags Ry Age (Mech ed) 89:138 Mr '15
Repairing 9½ in, air pump cylinder heads. B: Grady, diags Ry Age (Mech ed) 89:138 Mr '15

Rotary valveless air-pump. il diag Power 42: 355-6 S 7 '15

355-6 S 7 15 Special chucks for air pump repairs. W. W. Elfe. il Ry Age (Mech ed) 89:183 Ap '15 Test of turbo air pump, il diags Power 41: 442-3 Mr 30 '15

Sce also Air compressors; Air lifts

Air purification

Purification and sterilization of air. S. Born and W. F. Carthaus. il J Ind & Eng Chem 7:233-6 Mr '15

See also Air filters; Air washers; Dust removal; Smoke prevention

Air resistance

How rifle bullets fly. E: C. Crossman. il Sci Am 113:24+ Jl 3 '15 Why speed increases fuel consumption. Auto-mobile 33:427-8 S 2 '15

Air sampling

Rock-dust sampler. O. Ruhl. il-Eng & Min J 99: 238 Ja 30 '15

Air shafts

Air shaft C. H. S shaft illumination as studied by models. H. Sharp. Illum Eng Soc 9:598-610 no 7

Air testing
Test for dirt in an air supply. S. A. Moss. il
Gen Elec R 18:622-5 Jl '15
Testing the air supplied to turbo-generators.
Engineer 120:139-40 Ag 6 '15

See also Air-Analysis; Air sampling

Air washers

Air cleaning apparatus for the ventilation of generators and transformers. W: Baum. il diags Gen Elec R 18:801-12 Ag '15 Air washers for turbine generators. il Eng M 49:sup3-4 Je '15

Ideal air washer. il Heat & Ven 12:56-8 Mr

Lecture course on elements of heating, C: A. Fuller. Metal Work 84:583+ N 5 '15
Spray-type air washers and coolers for New York station, il diags Elec W 65:349-50 F 6

report of committee, with discussion. Am Soc Heat & V E 20:425-41 '14 Supplying air to generators at constant temperature and humidity. il diag Elec W 66:92 Jl 10 '15 Test for directions.

Test for dirt in an air supply. S. A. Moss. il Gen Elec R 18:622-5 Jl '15 Test of Kansas City air washer. il Elec Ry J 46:240-1 Ag 7 '15

See also Air filters

Air washing

Recent tests on recirculation of washed air. G. L. Larson, il Metal Work 84:675-7+ N 26 '15; Abstract. Am Soc M E J 37:723-4 D '15

See also Air filters; Air purification; Dust removal; Gas cleaning; Smoke prevention

Airships. See Balloons and airships

Akron, Ohio

Bridges

Ornamental bridge at Akron built of slag concrete, il Eng N 74:769-70 O 21 '15

Churches

Trinity Lutheran church, I. T. Frary, il plans Arch Rec 37:252-67 Mr '15

Sanitary affairs

Akron is building sewage and garbage disposal plants, plan Eng Rec 71:63 Ja 9 '15 Sewage disposal plant for Akron, il diags plan Munic J 39:71-4, 112-14 Jl 15-22 '15 Sewage-treatment and garbage-reduction works for Akron, Ohio. Eng N 73:147 Ja 28

Streets

Examination of Akron pavements. Munic J 37: 954-5 D 31 '14

Water supply

Akron's water purification plant, diags Munic J 38:725-8 My 27 '15 Low-lift centrifugal pumps at Akron will oper-ate under unusually varied conditions. F. A. Barbour, il Eng Rec 71:580-1 My 8 '15

Alabama Great Southern railroad Finances of the Alabama Great Southern. Ry Age 57:1034 D 4 '14

Alabama power company
Foundations for transmission line towers and
tower erection. W. E. Mitchell. diags pls Am
Inst E E Pro 34:1187-92 Je '15; Abstract.
Elec W 66:10 Jl 3 '15

Alarms, Electric. See Electric alarms

Alaska

Alaskan

Alaskan railroad surveys. D. L. Reaburn. il Eng N 73:104-6 Ja 21 '15 Alaska's road and bridge builders face snow, frozen ground and glacial floods. G. E. Ed-gerton. il map Eng Rec 71:764-6 Je 19 '15

Bridges

Construction and cost data on some highway bridge work in Alaska, F. A. Pope, Eng & Contr 42:387-8 O 21 '14

Description and travel

Dawson to Nome. H. E. Chako, il Eng & Min J 98:1121-6 D 26 '14

Industries and resources

Industries and resources
Alaskan mining in 1914. Eng & Min J 99:11619 Ja 9 '15
Chignik bay, Alaska, coal fields. W. R. Crane, il map Colliery 35:457-61 Ap '15
Kenai district. Eng & Min J 100:676 O 23 '15
Petroleum fields of Alaska. A. H. Brooks. maps Am Inst Min E Bul 98:199-207 F '15
Tin mining in Alaska. map Eng & Min J 100:838-9 N 20 '15
Winter mining at Fairbanks. H. I. Ellis. il diags Eng & Min J 100:707-11 O 30 '15

∟aw

United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94: pt 2, 861-913 '15

Railroads

See Railroads-Alaska

Albany, New York

Railroads

Delaware & Hudson terminal at Albany, N. Y. il plan Ry Age 59:58-60 Jl 9 '15 Difficult grade crossing elimination in Al-bany, N. Y. il diags plan Ry Age 59:961-3 N 19 '15

Sewerage

Albany sewage-disposal works. J: H. Greg-ory, plans Eng N 74:692-5 O 7 '15

Albany, New York—Sewerage—Continued Albany's sewage treatment plant; sixteen Im-hoff tanks and eight sludge beds, il diags Munic J 38:837-40 Je 17 '15

Alberta

Industries and resources

Correlation and geological structure of the Alberta oil fields. D. B. Dowling. map Am Inst Min E Bul 102:1355-64 Je '15

Albumin

Coagulation of albumin by electrolytes. W. D. Bancroft. Met & Chem Eng 13:317-18 My '15 How much albumen is needed in our diet? M. Hindhede. Sci Am S 79:327 My 22 '15 New method of producing albumen. Sci Am 113:120 Ag 7 '15

Alcalá De Henares, Spain

#### Architecture

Palacio arzobispal, now Archivo h A. G. Byne. il Brickb 24:85-8 Ap '15 historico.

Alcohol

fodder from wood. Sci Am 113:

Determination of methyl and ethyl alcohol in spirit varnishes. G. W. Knight and C. T.

Betermination of methyl and ethyl alcohol in spirit varnishes. G. W. Knight and C. T. Lincoln, J Ind & Eng Chem 7:837-43 O '15 Hardwood distillation industry in America. E: H. French and J. R. Withrow, il Met & Chem Eng 13:39-9 Ja. '15; Same, J Ind & Eng Chem 7:47-55; Discussion, H. O. Chute. 7:55-6 Ja. '15

Manufacture of ethyl alcohol from wood waste; the hydrolysis of white spruce. F. W. Kressmann. J Ind & Eng Chem 7:920-2 N '15 Manufacture of ethyl alcohol from wood waste; western larch as a raw material. F. W. Kressmann. J Ind & Eng Chem 7: 922-3 N '15

922-3 N 15 Occurrence of methyl alcohol in corn silage. E. B. Hart and A. R. Lamb, Am Chem Soc J 36:2114-18 O '14

Preliminary experiments on the effect of temperature control on the yield of products in the destructive distillation of hardwood. R. C. Palmer. diags J Ind & Eng Chem 7: 663-9 Ag '15

Alcohol, Denatured

Conditions of the Russian treasury department competition on the industrial uses of alcohol. J Ind & Eng Chem 7:637-8 Jl '15

Utilisation and denaturing of spirit. Engineer 120:184 Ag 20 '15

Alcohol as fuel

Fuel becomes French government monopoly in 1917. Automobile 33:486 S 9 '15

Manufacture of ethyl alcohol as a fuel for internal combustion engines. B. O. Jenkins. Sci Am 111:509 D 19 '14

New alcohol fuel. Engineer 119:584 Je 11 '15 Alcoholic solutions. See Solution (chemistry)

Absorption and the surface tensions of aqueous solution of homologous fatty acids and alcohols. M. Neidle, Am Chem Soc J 37:513-15 Mr '15

Aldehydes

Addition compounds of aldehydes and ketones with organic acids. J. Kendall and W. A. Gibbons. Am Chem Soc J 37:149-62 Ja '15

Isolation of crystalline dl-glyceric aldehyde from a syrup obtained by the oxidation of glycerol. E. J. Witzemann. Am Chem Soc J 36:2223-34 O '14

Synthetic preparation of dl-glyceric aldehyde. E. J. Witzemann, Am Chem Soc J 36:1908-16 S '14

Alfalfa

Enzymes present in alfalfa; alfalfa investigation. C. A. Jacobson and A. Holmes. Am Chem Soc J 36:2170-82 O '14

Algae growths cover Atlanta sewage filters. C: C. Hommon. il Eng Rec 72:335 S 11 '15 Alien labor. See Labor laws

Alkali soils Investigation of the durability of cement drain tile in alkali soils. R. J. Wig and G. M.

Williams, diags pls U S Bur Stand Tech Pa 44:1-56 '15; Excerpts, Concrete Cem 7:145-7 O '15 Ô

Alkalies

Ikalies
Binary and ternary systems of the nitrates of the alkali and alkaline earth metals. W: D. Harkins and G: L. Clark. Am Chem Soc J 37:1816-28 Ag '15
Commercial alkalies, their strength and value. Textile World 49:679-82 S '15
Search for an alkali element of higher atomic weight than cesium. G. P. Baxter. Am Chem Soc J 37:286-8 F '15

Soc J 37:286-8 F '15

See also Alkali soils; Ammonia; Concrete, Effect of alkalies on; Potassium; Sodium

Alkalimetric solutions

Arsenious oxide as an alkalimetric standard.
A. W. C. Menzies and F. N. McCarthy. Am
Chem Soc J 37:2021-4 S '15
Standardization of alkalimetric solutions. F. D.
Dodge. J Ind & Eng Chem 7:29-30 Ja '15

Alkaloids

See also Veratrine

Alleys

Alley problem. C: B. Ball. Eng N 74:871 N

Concrete alley paving in Chicago, S. E. Bates, il Munic Eng 49:147-8 O '15

Allis-Chalmers manufacturing co. Facts about Allis-Chalmers case. Iron Tr R 56:948-50 My 13 '15

Allotropy

Manganese steel and the allotropic theory.

A. Sauveur. il Am Inst Min E Bul 93:2439-49 S '14; Abstract. Iron Tr R 55:1002 N 26 '14; Discussion. Am Inst Min E Bul 100: 787-90 Ap '15

Metastability of metals. A. Vosmaer. Met & Chem Eng 13:535-6 S 1 '15
Physical changes in iron and steel. Engineer 120:15 Jl 2 '15

See also Critical point

Alloys

Acid-resisting alloy to replace platinum in the construction of a bomb calorimeter. S. W. Parr. il Am Chem Soc J 37:2515-22 N '15

Parr, il Am Chem Soc J 37(2515-22 N 15)
Bearing metal of high elastic limit. Iron Age
95:1016 My 6 '15
Brinnell hardness testing of non-ferrous
alloys, V. Skillman. Metal Ind n s 12:423-4
O '14; Same. Foundry 43:111-12 Mr '15
Choice of alloys for water work design. H.
Carpenter. Am Water Works Assn J 2:3518 Je '15; Same abr. Eng & Contr 43:333-4
Ap 14 '15

Determination of critical points in iron, steel and alloys, il diags Met & Chem Eng 13:643-

4 S 15 15
Developing an acid-resisting alloy. S. W. Parr. il Iron Tr R 57:991+ N 18 '15; Same. Metal Ind n s 13:457-8 N '15; Abstract. Am Soc M E J 37:656-7 N '15
Die-casting of white alloys. J: C. Work. Sch Mines Q 36:48-50 N '14
Formulas for specific gravity, etc., of alloys. W. L. Tryon. Foundry 43:222a Je '15
Industrial uses of metallic alloys. W. C. Carroll. Metal Work 84:70 Jl 16 '15
Many carbon-free metals and alloys now

any carbon-free metals and alloys available. H. D. Browne. Eng N 74:65

leed of standard railroad car-bearing alloy. R. R. Clarke. Foundry 43:457-8 N '15 Sew alloys of light metals. C. C. Mosher. Metal Ind n s 13:433-4 O '15 Need

New die casting metal; Ampco bronze. Met & Chem Eng 13:931 D 1 '15

Philosophy and properties of Clarke. Foundry 42:491-5 D'1 allovs. R. R.

Rapid analysis of alloys for tin, antimony and arsenic. F. A. Stief. diag J Ind & Eng Chem 7:211-12 Mr '15

Recent progress with alloys—theory explaining self-hardening metals including the special steels. L. Guillet, Automobile 31:1118-20 D 17 14

Specifications for alloys for high-speed super-heated steam turbine blading, W. B. Parker, il Engineer 120:441-3 N 5 '15

Alloys Continued

Strength of metals vs. composition, E. A. Lewis, Metal Ind n s 13:201-2 My '15

See also Aluminum alloys: Amalgams; Babbitt metal; Brass; Britannia; Bronze; Copper alloys; Iron alloys; Metallography; Metallurgy; Monel metal; Solder and soldering: Steel alloys

#### Patents

Court of appeals decision in nickel-chromium resistor suit. Met & Chem Eng 13:444-15 Jl '15

Almshouses

'ook county infirmary at Oak Forest, Ill. C. A. Erikson, il plans Brickb 24:277-82, pl 161-5 N '15

Alphabet

Cuneiforms. W. Rice. Inland Ptr 54:367-8 D

Egyptian alphabet, W. Rice, Inland Ptr 53: N6-8 S '14 How we got our alphabet: Aramean, alphabet of religions. W. Rice, Inland Ptr 54:508-9 Ja '15

'15
How we got our alphabet; earlier English and Irish alphabets. W. Rice. Inland Ptr 55:83-4 Ap '15
How we got our alphabet: Greek alphabets. W. Rice. Inland Ptr 54:689-90 F '15
How we got our alphabet; the alphabetic discoveries. W. Rice. Inland Ptr 55:531-2 JI '15
How we got our alphabet; the English alphabets. W. Rice. Inland Ptr 55:334-5 My '15
How we got our alphabet; the Latin alphabet. W. Rice. Inland Ptr 54:823-4 Mr '15

See also Cuneiform writing; Printing

#### Alton, Illinois

#### Sewerage

Design, construction and cost of new sanitary sewerage system at Alton, Ill. J. E. Schwaab. Eng & Contr 43:129-30 F 10 '15

Alumina

Alumina in steel. G: F. Comstock. il Met & Chem Eng 13:891-5 D 1 '15
Phosphate method for alumina. F. G. Hawley. Eng & Min J 99:536-7 Mr 20 '15

Aluminates

Constitution of aluminates, E: G. Mahin, Am Chem Soc J 36:2381-3 N '14 Constitution of aluminates, W: Blum, Am Chem Soc J 36:2383-4 N '14 Hydration of Portland cement, A. A. Klein and A. J. Phillips, pls U S Bur Stand Tech Pa 43:3-71 '14

Aluminum

Aluminum as a check to sulphide segregation in steel ingots. Iron Age 96:130 Jl 15 '15 Aluminum business in 1914, Eng & Min J 99: 80 Jn 9 '15

Aluminum in the gas industry. J Ind & Eng Chem 7:255-6 Mr '15 Aluminum: its origin and susceptibility. J. Scott. il Metal Ind n s 13:105-6 Mr '15 Aluminum most abundant metal. Metal Work 84:493 O 15 '15

84:493 O 15 '15
Aluminium nitride. diag Met & Chem Eng 13:504 Ag '15
Aluminum or iron crank cases; a comparison of the two materials on the bases of weight, strength and cost. V. I. Moncrieff. Horseless Age 35:582-3 Ap 28 '15
Aluminum precipitation at Nipissing. E. M. Hamilton. Eng & Min J 99:568-71 Mr 27 '15
Aluminum solder. Elec R & W Elec'n 67:670-1 O 9 '15

Aluminum solder, Elec R & W Elec'n 67: 670-1 O 9 '15 American institute of metals meeting at At-lantic City, Sept. 28. Iron Age 96:820-2 O

Analyzing heat flow; use of aluminum for automobile motor construction, E. H. Sherbondy, Automobile 33:834-5 N 4 '15

Autogenous soldering or welding of aluminum. il Mach 21:369-71 Ja '15

Cutting aluminum rapidly on a buzz planer, J Fr Inst 180:634 N '15

Manufacture of aluminum in the United States; electrometallurgical industries as possible consumers of electric power, D. A. Lyon and R. M. Keeney, J Fr Inst 180:479

Melting aluminum chips. H. W. Gillett. Meta Ind n s 13:417-18 O '15; Same. Foundry 43 462-3 N '15; Same. Iron Tr R 57:942-3 N

Methods of jointing aluminum, il Mach 21:470-

Nickel-plating on aluminium. Sci Am S 80:

197 S 25 '15 Recent developments in aluminum, E. Pannell, il Metal Ind n s 13:453-5 N '15 Satin finish on aluminum, Foundry 42:50 42:500 D

Small aluminum tubes, J. P. Sheehy, il diags Metal Ind n s 13:55-6 F '15 Soldering and brazing aluminum, Mach 21:286-

Successful acetylene aluminum welding. Metal Work 84:173-4 Ag 6 '15 Use of aluminium in war. N. Flamel. Sci Am S 80:208 S 25 '15

Working aluminum at 400 degrees fahrenheit. il Horseless Age 36:373 O 15 '15

Aluminum alloys

Adoption of aluminum pistons. W. M. Levett.
Automobile 33:121 + 8 2 - 15
Aluminum alloy piston. J. E. Diamond. il diag
Automobile 33:551-2 S 23 - 15
Aluminum alloys as surface protection for
metals subject to high temperatures. Eng N
72:1123 D 3 - 14

Aluminum in automobile chassis. A. L. Clayden; J. E. Diamond, Automobile 33:330-1 Ag

Aluminum-nickel, J. Canac and E. Tassilly. Eng M 49:273-4 My '15 Aluminum piston will never prove success in truly high-duty motor, F. R. Porter, Auto-mobile 33:420-1 S 2 '15 Aluminum versus steel in motor construc-tion, J. E. Diamond, Automobile 33:508-9 S 16 '15

16 '15 Binary alloys of aluminum; abstract, H. Schirmeister, Am Soc M E J 37:721 D '15 Exposure tests of light aluminum alloys, Wilson, Elec R & W Elec'n 67:674 O 9 '15 How scientific design and use of aluminum alloys will cheapen motoring, A. L. Clayden, il diag Automobile 33:225-30 Ag 5 '15 How titanium-aluminum bronze is produced, C. Vickers, il Foundry 43:273-8 Jl '15 Manufacture and use of alumino-vanadium; abstract, W. W. Clark, Am Soc M E J 37: 656 N '15

abstract. 656 N '15

656 N '15
Piston practice; present day design with special reference to aluminum alloy, J. E. Diamond, il diags Automobile 33:871-7 N 11 '15; Discussion, 33:921-4 N 18 '15
Possible troubles with aluminum motor, A, L, Clayden and others, il Automobile 33:275-7 Ag 12 '15

Ag 12 '15
Properties of aluminum bronze alloys, W. M.
Corse, il Foundry 43:459-60 N '15
Titanium aluminum bronze, W. M. Corse and
C: Vickers, Metal Ind n s 13:190-1 My '15
Titanium-aluminium bronze castings, W. M.
Corse, Met & Chem Eng 13:511-12 Ag '15

See also Calorizing; Magnalium

### Aluminum chloride

luminum chloride
Action of aluminium chloride on the aliphatic ethers. G. B. Frankforter and E. A. Daniels. Am Chem Soc J 37:2560-7 N '15
Improvement of high boiling petroleum oils, and the manufacture of gasoline as a byproduct therefrom, by the action of aluminum chloride. A. M. McAfee. J Ind & Eng Chem 7:737-41 S '15; Same. Met & Chem Eng 13:592-7 S 15 '15; Same abr. Am Gas Light J 103:293-5+ N 8 '15

Aluminum founding

Aluminum founding
Aluminum aeroplane motor casting, il Automobile 33:371 Ag 26 '15
Aluminum die casting a commercial achievement, C: Pack, Metal Ind n s 13:412-13 O '15; Same, Foundry 43:456-7 N '15; Same, Iron Tr R 57:1036+ N 25 '15; Same cond, Iron Age 96:820 O 7 '15
Aluminum die castings, A, B, Norton, Metal Ind n s 12:503-4 D '14
Difficulties with aluminum match-plates, Foundry 43:13-14 Mr '15
How to make automobile engine castings, il Foundry 13:291-4 Ag '15
Making aluminum automobile bodies, il Iron Age 95:1213-16 Je 3 '15

Aluminum hydroxide

Effect of ammonium chloride upon ferric and aluminum hydroxides during ignition. H. Daudt. J Ind & Eng Chem 7:847-8 O'15

Aluminum jodide

Ammonobasic aluminium iodides. E: C. Frank-lin. Am Chem Soc J 37:847-52 Ap '15

Aluminum metallurgy
Electro-metallurgical industries as possible
consumers of electric power. D. A. Lyon
and R. M. Keeney. Am Inst Min E Bul 104:
1719-24 Ag '15
Hall process of aluminum production. Eng N
73:177-8 Ja 28 '15

Smelting of metals in the electric furnace. D. A. Lyon and R. M. Keeney. U S Bur Mines Bul 77:72-81 '14

Aluminum pistons. See Pistons

Aluminum sulphate

Columbus waterworks makes its own alum— a revolutionary step in water purification practice, C: P. Hoover, il plan Eng Rec 71: 576-7 My 8 '15; Same, Eng & Contr 43:448-9 My 19 '15

Aluminum trioxide

Comparison of the relative drying powers of sulfuric acid, calcium chloride and aluminum trioxide when used in ordinary Scheibler desiccating jars. J. W. Marden and V. Elli-ott. J Ind & Eng Chem 7:320-1 Ap '15

Alunite and pyrophyllite in triassic and jur-assic volcanics at Kyuquot Sound, British Columbia. C: H. Clapp. Econ Geol 10:70-88 Ja '15

Amalgamation

Amalgamation tests. W. J. Sharwood. Am Inst Min E Bul 104:1659-70 Ag '15; Excerpts. Met & Chem Eng 13:927 D 1 '15

See also Alloys; Amalgams; Mercury

Effect upon their solution tensions of dissolving the alkali and alkali earth metals in mercury, and the constitution of such solutions. G: M. Smith. Am Chem Soc J 37:76-80 Ja '15

Relative efficiency elative efficiency of various amalgams in the recovery of gold. F. A. Thomson and R. Keffer. Met & Chem Eng 13:367-70 Je '15

Vapor pressure of thallium amalgams. J. H. Hildebrand and E. D. Eastman, Am Chem Soc J 37:2452-9 N '15

Vapor pressures of silver, gold and bismuth amalgams. E. D. Eastman and J. H. Hilde-brand, diags Am Chem Soc J 36:2020-30 O

Amazon stone

Occurrence of amazon stone at North White Plains, N. Y. F. F. Burr. il Sch Mines Q 36:186-8 Ja '15

Lightest known wood. Sci Am S 79:96 F 6 '15

Ambulance trains. See Hospital trains

Ambulance corps dispatched to front. il diags Automobile 31:1166-8 D 24 '14

American ambulances in the field, il Automobile 32:266-9 F 11 '15

British give cars for ambulance work, il Automobile 33:323 Ag 19 '15

War uses of the motorcycle: cycle ambulance and motor machine gun. il Sci Am 112:138+ F 6 '15

American academy in Rome
Description of building, educational policy, etc.
C. G. La Farge. il Am Inst Arch J 3:52-72
F '15

American association of engineers Organization. Power 42:459-60 S 28 '15

Time at hand when the engineering society should awake to its deficiencies, E. McCullough; abstracts. Eng Rec 72:421-2 O 12 '15; Power 42:530-1 O 12 '15

American association of passenger traffic of-

ficers
Special meeting, French Lick, Ind., Oct. 26.
Ry Age 59:854-5 N 5 '15

American association of public accountants
Advantages of society and association affiliations. J. P. Joplin. J Account 19:325-33 My

American association of railroad superintendents 28th annual convention, San Francisco, Aug. 19-20. Ry Age 59:379-82 Ag 27 '15

American association of state highway officials New association of state highway officials. Eng Rec 70:sup295 D 19 '14 Organization, Washington, D. C., Dec. 12. Good Roads n s 9:38 Ja 2 '15

American boiler manufacturers' association 22. Iron Tr R 56:1301 Je 24 '15

American chemical society

merican chemical society
50th meeting, New Orleans, March 31-April 3.
J Ind & Eng Chem 7:370-9 My '15
50th meeting, New Orleans, March 31-April 3.
Met & Chem Eng 13:280-8 My '15
50th meeting; program of papers and reports
of committees. J Ind & Eng Chem 7:441-3
My '15

My 15 15tst meeting, Seattle, Wash., Aug. 31-Sept. 3. Met & Chem Eng 13:587-92 S 15 '15 51st meeting, Seattle, Wash., Aug. 31-Sept. 3; program of papers. J Ind & Eng Chem 7: 890-1 O '15

American civic association oth annual convention, Munic J 37:967 D 31 '14 Washington, D. C.

Munic 37:397 D 31 14

American concrete institute
Edison fire discussed at Concrete institute,
Chicago, Feb. 9-12. Eng Rec 71:248 F 20 '15
11th annual convention, Chicago, Feb. 9-12.
Concrete Cem 6:113-22 Mr '15
11th annual convention, Chicago, Feb. 9-12.
Eng N 73:360-1 F 18 '15

American concrete pipe association
Annual convention, Chicago, Feb. 15-16, 1915.
Concrete Cem 6:141 Mr '15

American cotton manufacturers' association Meeting at Memphis. Textile World 49:176-97 My '15

American electric railway association
Annual convention, San Francisco, 1915; abstracts of papers, reports and discussions.
Elec Ry J 46:701-69 O 9 '15
Annual convention, San Francisco, Oct. 4-8.
Elec W 66:791 O 9 '15

Annual convention, San Francisco, Oct. 4-8; program. Elec Ry J 46:362-4 Ag 28 '15

Chicago Elevated section formed. Elec Ry J 45:797 Ap 24 '15 Code of principles. Elec Ry J 44:992, 1040 O 31, N 7 '14

Code of principles, Ry R 55:768 D 26 '14 Code of principles, O. T. Crosby, Elec Ry J ode of principles. 45:370-3 F 20 '15

ode of principles. T. S. Williams. Elec Ry J 45:220-2; Discussion. G. E. Tripp; M. G. Brush. 45:214-16 Ja 30 '15

Poisoning the wells: objection to the Code of principles by the "New republic." Elec Ry J 44:1230 D 5 '14

7th annual mid-year meeting. Elec Ry J 45: 214-19 Ja 30 '15

American electrochemical society
American electrochemical society in its external relations. F. A. Lidbury. Met & Chem
Eng 13:277-9 My '15

27th general meeting. Atlantic City, April 22-23. Elec R & W Elec'n 66:821-4 My 1 '15

27th general meeting, Atlantic City, April 22-23. Elec W 65:1108-10 My 1 '15

27th general meeting, Atlantic City, April 22-23. Met & Chem Eng 13:314-29 My '15

8th general meeting, San Francisco, S 16-17. Elec R & W Elec'n 67:625-8 O 2

American electroplaters' society
Outlook for the future effect of the society
on Canadian metal industries. W. S. Barrows. Metal Ind n s 13:226-8 Je '15

3d annual convention, Dayton, O., June 3-5. C: H. Proctor. Metal Ind n s 13:223-5 Je '15 l annual meeting, Dayton, O., June 3-5. Foundry 43:284 Jl '15

American federation of arts

6th annual convention. Am Inst Arch J 3:241-3 Je '15

American forestry association Forest relations between the East and t West as the East hopes to see them. H: Drinker, Am For 21:1054-6 N '15 the

American foundrymen's association Annual convention, Atlantic City. Foundry 43: 385-94 O '15

385-94 O '15
Annual convention, Atlantic City, Iron Tr R
57:694-701 O 7 '15
Annual meeting at Atlantic City; programs.
Foundry 43:333-41 S '15
Convention held at Atlantic City, Sept. 27Oct. 1; abstract of papers and discussion.
Iron Age 96:814-19, 822-4 O 7 '15

American gas institute Address. E. C. Jones. Am Gas Light J 103:213

O 4 15 Constitution and by-laws. Am Gas Inst Pro 9: pt 1, 46-62 '14 List of members of the American gas insti-tute. Am Gas Inst Pro 9:pt 2,1815-1926 '14

American good roads congress. See American road builders' association

American institute of architects

First award of the collaborative prize of the A. I. A. to the students of the American academy in Rome, il Am Inst Arch J 3:344-5

48th annual convention: summarized report of the proceedings. Am Inst Arch J 2:579-99 D

Personal reminiscences of Charles Follen Mc-Kim. G. Brown. Arch Rec 38:575-82 N '15

American institute of chemical engineers Los Angeles meeting, Aug. 16-18, Met & Chem Eng 13:530 S 1 15

The annual meeting, Philadelphia, Dec. 2-5, 1914. Eng & Min J 98:1033 D 12 '14 '7th annual meeting, Philadelphia, Dec. 1914. J Ind & Eng Chem 7:64-9 Ja '15 '7th annual meeting, Philadelphia, Dec. 2-5, 1914. Met & Chem Eng 13:41-2 Ja '15 '7th semi-annual meeting, San Francisco, Aug. 25-28. Met & Chem Eng 13:603-17 S 15 '15

American institute of electrical engineers History of the Schenectady section of the A. I. E. E. S. M. Crego. Gen Elec R 18: 1006-7 O '15

Midwinter convention; abstracts of papers. Elee W 65:523-8 F 27 '15
Midwinter convention, New York city, February 17-19, 1915. Elec R & W Elec'n 66: 389-96 F 27 '15
Panama-Pacific convention, San Francisco, Sept. 16-18. Elec R & W Elec'n 67:567-73 S 25 '15

25 '15
Panama-Pacific convention, San Francisco,
Sept. 16-18. Elec W 66:677-9 S 25 '15
32d annual convention, Deer Park, Md., June
29-July 2. Eng N 74:90-1 Jl 8 '15
32d annual convention, Deer Park, Md., June
29-July 2; abstracts of papers and discussions. Elec R & W Elec'n 67:69-75 Jl 10

32d annual convention, Deer Park, Md., June 29-July 2; abstracts of papers and discus-sions. Elec W 66:6-11, 62-7 Jl 3-10 '15 306th meeting, Cleveland, Ohio, March 18-19. Elec R & W Elec'n 66:595-8 Mr 27 '15 314th meeting, St. Louis, Oct. 19-20. Elec R & W Elec'n 67:806-8 O 30 '15

Industrial power committee

Industrial power committee. D: B. Rushmore. Am Inst E E Pro 34:711-14 My '15

American institute of metals

merican institute of metals
Annual convention, Atlantic City, Sept. 2830. Iron Tr R 57:702-4 O 7 '15
Annual meeting, Atlantic City, Sept. 28-30.
Foundry 43:394-7 O '15
Annual meeting, Atlantic City, Sept. 28. Iron
Age 96:819-22 O 7 '15
Annual meeting, Atlantic City, Sept. 28-30.
Met & Chem Eng 13:712 O 15 '15
Annual meeting, Atlantic City, Sept. 29-Eng
& Min J 100:597 O 9 '15
Annual meeting Atlantic City, Sept. 29. Eng
& Min J 100:597 O 9 '15
Annual meeting of foundrymen and exhibition
of foundry supplies and apparatus held at
Atlantic City, Sept. 25-Oct. 1. il Metal Ind
n s 13:401-6 O '15

American institute of mining engineers

American institute of mining engineers
A. I. M. E., considering changes. Eng & Min
J 98:1057-8 D 12 '14
Annual New York meeting, Feb. 15-17. Eng &
Min J 99:377-8 F 20 '15
May the Institute indorse opinions? R. W. Raymond. Eng & Min J 99:205-6 Ja 23 '15
Officers, members, rules, etc. Am Inst Min E
Bul 101:sup1-190 My '15
110th meeting, New York city, Feb. 15-17.
Met & Chem Eng 13:177-85 Mr '15
Pittsburg meeting. Colliery 35:245-6 D '14
Shall the A. I. M. E. be able to express itself?:
Opposition's case by R. W. Raymond;
Affilirmative view by J. F. Kemp. Eng & Min
J 98:1054-6 D 12 '14
merican international corporation

American international corporation

Big financial concern to aid foreign trade. Ry

R 57:705 N 27 '15

Organize to promote foreign trade. Elec W 66:1180-1 N 27 '15

American iron and steel institute Cleveland meeting, 1915. Iron Tr R 57:846-8 O 28 '15

O 28 '15 Cleveland meeting, 1915; papers. Iron Age 96: 984-1005, 1025-8 O 28 '15 8th general meeting, New York city, May 28. Iron Age 95:1243-5+ Je 3 '15 9th general meeting, Cleveland, Oct. 22-23. Met & Chem Eng 13:380-1 N 15 '15 Spring meeting, New York city, May 28. Iron Tr R 56:1117-18 Je 3 '15

American mining congress 17th annual meeting. W Soc E J 19:1016-18 D

American museum of natural history Two groups in the American museum of nat-ural history, J. W: Griggs, il Sci Am 112: 345 Ap 10 '15

American museum of safety New York Central awarded Harriman safety medal. Ry Age 58:271-2 F 12 '15

American public health association 42d annual convention, Jacksonville, Fla., Nov. 30 to Dec. 4, 1914. Munic J 37:902-3 D 17

14

43d annual meeting, Rochester, N. Y., Sept. 6-13. Munic J 39:483-4+ S 23 '15 Sanitary engineering section discusses re-fuse disposal, sewerage, water supply and methods of analysis. Eng Rec 70:sup285-6 D

1914. L. C.

American railway association Fall meeting, Chicago, Nov. 18, Fritch. Ry Age 57:1113 D 18 '14 Fall session, Chicago, Nov. 17, 57:648-9 N 20 '15 1915. Ry R

American railway bridge and building association

ation 25th annual convention, Detroit, Mich., Oct. 19-21. Eng N 74:858-9 O 28 '15 25th annual convention, Detroit, Mich., Oct. 19-21. Ry Age 59:753-64 O 22 '15 25th annual convention, Detroit, Mich., Oct. 19-21. Ry R 57:516-19 O 23 '15

merican railway engineering association Assigned work of railway engineering associa-tion. Eng Rec 71:526-7 Ap 24 '15 Committee reports on electricity, ties, wood preservation, fences. Elec Ry J 45:570-1 Mr

Committees; complete list of names of members appointed and subjects specified for investigation and report. Ry Age 58:853-5 Ap

16'15
President's address. W. B. Storey. Ry R 56: 385-6 Mr 20'15
16th annual convention, Chicago, March 16-18. Eng Rec 71:411-12 Mr 27'15
16th annual convention: committee reports. Ry R 56:386-403 Mr 20'15
16th annual meeting, Chicago, March 16-18. Eng N 73:598-9 Mr 25'15
Year's work reviewed. Eng Rec 71:374-7 Mr 20'15

American railway master mechanics' association

Committees. Ry R 57:522-3 O 23 '15 48th annual convention, Atlantic Ci 9-11. Elec Ry J 45:1115-17 Je 12 '15

48th annual convention, Atlantic City, June 9-11. Ry R 56:806-9, 847-53 Je 12-19 '15

American railway perishable freight association Semi-annual meeting, Chicago, Sept. 8. Ry Age 59:513 S 17 '15

Age 33.35 S 11 13

American railway tool foremen's association

7th annual convention, Chicago, July 19-21.

Ry Age 59:193-4 Jl 30 15

7th annual convention, Chicago, July 19-21.

Ry Age (Mech ed) 89:409-16 Ag '15

7th annual convention, Chicago, July 19-21.

Ry R 57:115-17 Jl 21 '15

American road builders' association
Abstracts of papers at the 11th annual convention held at Chicago, Dec. 14-18, 1914.
Eng Rec 70:663-5 D 19 '14
5th American Good roads congress and 11th annual convention of the American road builders' association at Chicago, Dec. 14-18, 1914. Good Roads n s 9:3-29, 53-75, 96-106
Ja 2, F 6, Mr 6 '15
5th Good roads congress of the American road

5th Good roads congress of the American road builders' association, 1914. Eng N 72:1277-8 D 24 '14

D 24 '14
11th annual convention, Chicago, Dec. 14 to
18. Eng Rec 70:sup305-6 D 26 '14
11th annual convention, Chicago, Ill., Dec. 1418. Good Roads n s 8:235-9, 247-8, 249-50;
9:1-2 D 5, 19-26 '14, Ja 2 '15
11th annual convention, Chicago, Ill., Dec.
15, 1914. il Munic J 37:933-6 D 24 '14
Report of committee on standards. Good Roads
n s 9:223-9 4.5 '15

9:223-9 Jo

American road congress, Fourth Meeting at Atlanta, Nov. 9-13. Concrete Cem 5:266-7 D '14

oad congress at Atlanta. Good Roads n s 8: 217-20 D 5 '14

American smelting & refining co.
Abstract of the annual report for 1914. Eng
& Min J 99:582-3 Mr 27 '15
Securities, Eng & Min J 100:361 Ag 28 '15

American society for testing materials
18th annual meeting, Atlantic City, N. J.,
June 22-26, Iron Age 95:1405 Je 24 '15; Concrete Cem 7:43-4 Jl '15; Eng N 74:36-41, 67-9
Jl 1-8 '15; Eng Rec 72:28-9 Jl 3 '15; Power
12:33-6 Jl 6 '15; Ry Age 59:61-8 Jl 9 '15
Fifty-three standards considered, Iron Tr R
57:37-48 Jl 1 '15
Testing society still grows, Iron Tr R 56;
13:00 Je 24 '15

American society of civil engineers American society of civil engineers on eve of important action. Eng Rec 71:574-5 My 8 '15 Needs of the society. Eng Rec 71:67 Ja 16 '15

Reeus of the society. Eng Rec 71:67 Ja 16 '15 Rules for special technical committees. Eng Rec 71:121-2 Ja 23 '15 62d annual meeting. New York, Jan. 20, 1915. Eng N 73:185-7 Ja 28 '15 62d annual meeting, New York, Jan. 20, 1915. Eng Rec 71:122 Ja 23 '15

American society of heating and ventilating

1300 Je 24 '15

engineers
Constitution and by-laws. Am Soc Heat & V E 20:448-58 '14
Our society, its aims and opportunities; with discussion, J. J. Blackmore. Am Soc Heat & V E 20:392-404 '14

& V E 20:392-404 '14
Semi-annual meeting, Atlantic City, Sept. 1617. Dom Eng 72:379-80 S 25 '15
Semi-annual meeting, Atlantic City, Sept. 1617. Heat & Ven 12:33-9 O '15
Semi-annual meeting, Atlantic City, Sept. 1617. Heat & Ven 12:33-9 O '15
Semi-annual meeting, Atlantic City, Sept. 1617. Metal Work N:141-17 S 24 '15
21st annual meeting, January 19-22, 1915.
Heat & Ven 12:39-48 F '15
21st annual meeting, New York city, January
19, 1915. Metal Work 83:203-7+ Ja 29 '15
21st annual meeting, New York city, Jan. 1922. Dom Eng 70:144-7 Ja 30 '15
21st annual meeting, New York Jan 19-22.

21st annual meeting, New York, Jan. 19-22, 1915, Power 41:175-8 F 2 '15

American society of marine draftsmen 4th annual convention, New York, April 16-17. Int Marine Eng 20:211 My '15

Object of the society and its success. Int Marine Eng 20:193 My '15

American society of mechanical engineers Annual meeting in New York, Dec. 1-4, 1914. Elec Ry J 44:1248-50 D 5 '14

Fall meeting New York, Dec. 1-4, 1914. Iron Tr R 55:1093-7 D 10 '14

Mechanical engineers meet at San Francisco. Power 42:460-1 S 28 '15 Reports of standing committees. Am Soc M E

37:ix-xvi D '15

San Francisco meeting, Sept. 16-17. Iron Age Spring meeting. il Am Soc M E J 37:v-xiii

My '15
Spring meeting, Buffalo, June 22-25. Iron Tr
R 57:19-50 Jl 1 15
35th annual meeting, Dec. 1-4, 1914. Am Soc
M E J 37:1-6 Ja '15
35th annual meeting, New York city, 1914. Eng
N 72:1188-9 D 10 '14
35th annual meeting, New York, Dec. 1-4.
Power 40:863-6 D 15 '14

American society of municipal improvements Convention, Dayton, O. Eng N 74:810-12 O 21

Dayton convention, Oct. 12-15. Munic Eng 49: 189-90 N '15
22d annual convention, Dayton, O., Oct. 12-15. Munic J 39:629-32 O 21 '15
Twenty-one years of growth and activity. Munic J 39:535-9 O 7 15
Work of society committees. Munic J 39:619-20 O 21 '15

American society of refrigerating engineers 10th annual meeting, New York, Nov. 3 Dec. 1. Power 40:866-7 D 15 '14

American society of sanitary engineering 10th annual meeting, San Francisco, August 9-11. Dom Eng 72:262-5 Ag 28 '15 10th annual meeting, San Francisco, August 9-11. Metal Work 84:318-20 S 3 '15

American supply and machinery manufacturers'

association nnual convention, Philadel Iron Age 95:1290-3 Je 10 '15 Annual Philadelphia, June 3-4.

American telephone & telegraph co.
Annual report. Elec W 65:753-4 Mr 20 '15
Annual report for the year ended December
31, 1914, Elec R & W Elec'n 66:532-3 Mr
20 '15

American uniform boiler law society

Promulgation of the boiler code. Am Soc M E

J 37:xix-xx D '15

American water works association Constitution and list of members. Am Water Works Assn J Sup 1:1-94 D '14

Constitution and list of members, June, 1915. Am Water Works Assn J Sup2:1-104 Je '15 35th annual convention, Cincinnati. Eng Rec 71:663-6 My 22 '15

35th annual convention, Cincinnati, May 10-14. Am Water Works Assn J 2:239-317 Je 14. Am

35th annual convention, Cincinnati, May 10-14. Eng N 73:1000-1 My 20 '15

35th annual convention, Cincinnati, May 10-14. Munic J 38:705-8 My 20 '15

Water-works co-operation. G: G. Earl. Eng N 73:999-1000 My 20 '15

American wood preservers' association Abstracts of papers presented at the 11th annual convention, Chicago, Jan. 19-21. Eng Rec 71:105-8, 144-5 Ja 23-30 '15

11th annual convention, Chicago, Jan. 19-21. Elec Ry J 45:181-2 Ja 23 '15

11th annual convention, Chicago, Jan. 19-21, 1915. Eng N 73:182-3 Ja 28'15

11th annual convention, Chicago, Jan. 19-21, 1915. Ry R 56:115-17 Ja 23 '15

11th annual convention, Chicago, Jan. 19-21, 1915: abstracts of papers and discussions. Ry Age 58:158-63 Ja 22 '15

Modifications made in committees' recommendations. Elec Ry J 45:237 Ja 30 '15

Wood preservers open ranks to young men. Eng Rec 71:155-6 Ja 30 '15

Amides Periodides of acid amides and their addition products with metallic salts; substances of exceptionally high molecular weight, F. J. Moore and R. M. Thomas. Am Chem Soc J 36:1928-37 S '14

Reactions in liquid ammonia. E: C. Franklin. Am Chem Soc J 37:2279-95 O '15

Amino acids

of the amino acids of feeding-stuffs by the Van Slyke method. H. S. Grindley, W. E. Joseph and M. E. Slater. Am Chem Soc J 37:1778-81 Jl '15

Amino nitrogen

Total amino nitrogen in the seedlings of the Alaska pea. T: G, Thompson. Am Chem Soc J 37:230-5 Ja '15

Ammeters

Meaning of alternating-current ammeter readings. V W. S. Franklin, diags Elec W 64:1112

Proper use of ammeter and voltmeter in the plating room. Metal Ind n s 13:67-8 F '15 Voltmeter and ammeter in the plating room. S. E. Huenerfauth. Metal Ind n s 13:71 F '15 See also Ampere-hour meters

Ammonia

Ammonia a heat vehicle. A. Johnson. Power 41:727 My 25 '15; Same. Sci Am S 80:55 Jl 24 '15

24'15 Ammonia explosions in refrigerating plants; abstract. G. Cattaneo. Am Soc M E J 37: 344-5 Je'15 British producer-gas and ammonia-recovery plant. duags Met & Chem Eng 13:456-8 Jl'15 Carbonization in bulk—Koppers' ovens. C. J. Ramsburg. il diag Am Gas Inst Pro 9:pt 1, 504.601'14

594-601 '14
Coal gas residuals—Feld process. F. H. Wagner. diags Am Gas Inst Pro 9:pt 1, 340-61 '14; Same cond. Am Gas Light J 101:307-9 N 16 '14; Same cond. Met & Chem Eng 12: 699-702 N '14; Same cond. Sci Am S 80:318-19 N 13 '15; Discussion. Am Gas Inst Pro 9:pt 1, 361-7 '14
Decomposition of ammonia and the chances of explosions E. L. Fairbanks. Power 42:

tion of ammonia and the chances sions, F. L. Fairbanks, Power 42: 23 '15 of explosions. 715-17 N 23 '1

Potter and R. S. Snyder. il J Ind & Eng Chem 7:221-6 Mr '15

Explosion of ammonia vapor. Am Gas Light J 102:91 F 8 '15

J 102:91 F 8 '15
Extracting ammonia. diag Am Gas Light J
103:148 S 6 '15
Initial charge with anhydrous. H. G. Gibson.
Power 42:681 N 16 '15
New apparatus for the manufacture of aqua
ammonia from raw gas liquor. R. W. Hilgenstock, il diag Am Gas Light J 103:241-3 '15

Precipitant for ammonia. S. S. Graves. Am Chem Soc J 37:1171-81 My '15 Reactions in liquid ammonia. E: C. Franklin. Am Chem Soc J 37:2279-95 O '15 Vapor pressures of acetylene, ammonia and isobutane at temperatures below their normal boiling points. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:2482-6 N '15

Ammonia compressors Ammonia compressor alarm, G. A. Robertson. Power 41:N5 Je 15 '15 Ammonia diagrams. Power 40:930; 41:204 D 29 '14, F 9 '15

Effect of superheated ammonia on compressor capacity. H. R. Howell. Power 42:646-7 N

9 '15
Equipment and methods in largest refrigeration system. C: H. Bromley. Power 40:843-4, 878-83 D 15-22 '14
Gaskets for plugs of compressor valves. A. G. Solomon. Power 41:61 Ja 12 '15
Incorrect diagrams from compressor. F. V. Larkin. Power 41:415 Mr 23 '15
Massachusetts ammonia safety regulations. F. L. Fairbanks. diags Power 42:753-6 N 30 '15
Overhauling the ammonia compressor. F. E.

Overhauling the ammonia compressor. F. E. Matthews. Power 42:479-81 O 5 '15

Power requirements of ammonia compressors, W. N. McKee. Power 41:158-60 F 2 '15

Ammonia condensers

Cleaning ammonia condensers. A. G. Solomon, Power 42:761-2 N 30 '15

Purging ammonia condensers. C. strom. Power 42:311-12 Ag 31 '15 O. Sand-

Purging ammonia condensers. G. A. Robertson, diag Power 42:15 Jl 6 '15

Removing scale from ammonia condensers. A. G. Solomon, Power 42:84-5 Jl 20 '15

Ammonium chloride

Effect of ammonium chloride upon ferric and

Effect of ahmonium chloride upon ferric and aluminum hydroxides during ignition. H. W. Daudt. J Ind & Eng Chem 7:847-8 O '15 Mixed crystals of ammonium chloride with manganese chloride. H. W. Foote and B. Saxton. Am Chem Soc J 36:1695-1704 Ag '14

Ammonium citrate

Tri-ammonium citrate. R. A. Hall, Am Chem Soc J 37:208-16 Ja '15

Ammonium halides

Densities and degrees of dissociation of the saturated vapors of the ammonium halides, and the related thermal data. A. Smith and R. H. Lombard. Am Chem Soc J 37:38-70 Ja '15

Ammonium hydroxide

Behavior of ammonium phosphomolybdate with ammonium hydroxide. P. B. Sircar. Am Chem Soc J 36:2372-4 N '14
Electrochemical oxidation of hydrazine sulfate and ammonium hydroxide. J. W. Turrentine and J. M. Olin. Am Chem Soc J 37: 1114-22 My '15

se of ammonium hydroxide for the extraction of rosin from wood. H. K. Benson and H. N. Crites. J Ind & Eng Chem 7:918-20 N '15

Ammonium oxalate

Thorium ammonium oxalate. C. James, C. F. Whittemore and H. C. Holden. Am Chem Soc J 36:1853-6 S '14

Ammonium phosphomolybdate

with ammonium phosphomolybdate with ammonium hydroxide. P. B. Sircar. Am Chem Soc J 36:2372-4 N '14 Behavior

Ammonium salts

mmonium salts

Neutral ammonium salts of some substituted benzoic acids. L. McMaster and I. H. Godlove. Am Chem Soc J 37:2181-8 S '15

Study of the preparation and properties of the ammonium salts of organic acids.

L. McMaster. Am Chem Soc J 36:1916-25

Valence of nitrogen in ammonium salts. W: A. Noyes and R. S. Potter. Am Chem Soc J 37: 189-203 Ja '15

Ammonium sulphate

mmonium sulphate
Discoloration of sulphate of ammonia. Am
Gas Light J 102:92-3 F 8 '15
Production of sulphate of ammonia in 1914.
Am Gas Light J 103:161-4 S 13 '15; Same
cond. Met & Chem Eng 13:638-9 S 15 '15
Quality of sulfate of ammonia for export. J Ind
& Eng Chem 7:160 F '15

Ammunition

Mmunition

Ammunition and finance in the present war.

Sci Am 112:604 Je 19 '15

Ammunition components, United States army
—principle dimensions and general specifications. Iron Age 96:sup358a Ag 12 '15

Cost of munitions of war. Mach 21:405 Ja '15

Field artillery and ammunition. G: B. Jewell.

il diags Eng M 49:698-711 Ag '15

Gun-primers and detonators. Sci Am S 80:
35 JI 17 '15

Safe transportation of small-arms ammu-

afe transportation of small-arms nition, il Sci Am 112:589-90 Je 12 '1 ammu-

See also Bullets; Explosives, See also Bullets; Explosives, Military; Gunpowder; Projectiles; Shells; Shrapnel

Amole

mole for laundering woolen goods. Sci Am 112:49 Ja 9 '15 Amole

Amorphous substances

Filing system in the chemistry of amorphous substances, W. K. Lewis, Met & Chem Eng 13:921 D 1 '15

Ampere-hour meters

Ampere-hour meters on the Annapolis short line. Elec Ry J 45:722-3 Ap 10 '15 Mercury-type ampere-hour meter. il Elec W 66:1164 N 20 '15

Meter results on Chicago & Milwaukee line. il diag Elec Ry J 45:973-6 My 22 '15 New ampere-hour meter for electrolytic works and refineries. il Met & Chem Eng 13:191 and re Mr '15

Ampersand

Use of the ampersand, or short and. J. L. Frazier, Inland Ptr 54:661-3 F '15

Amphibia

Rare amphibians at the New York zoological park, R. L. Ditmars, il Sci Am S 80:196 S 25 '15

Amphitheaters. See Stadia

Amylases

Comparison of certain properties of pancre-

comparison of certain properties of pancre-atic and malt amylase preparations. H. C. Sherman and M. D. Schlesinger, Am Chem Soc J 37:1305-19 My '15 Further experiments upon the purification of malt amylase. H. C. Sherman and M. D. Schlesinger. Am Chem Soc J 37:643-8 Mr 15

Influence of certain acids and salts upon the activity of malt amylase. H. C. Sherman and A. W. Thomas. Am Chem Soc J 37: 623-43 Mr '15

Anaglyphs

Anaglyphs. Sci Am 113:68 Jl 17 '15

Analoid method

Analoid method for the determination of man-ganese in steel, iron ore and clar Mote ganese in steel, iron ore and slag. Met & Chem Eng 12:793-4 D '14

naloid method for the determination of phosphorus in steel, iron and slag. Met & Chem Eng 13:191-2 Mr '15 Analoid

Analysis of food, See Food-Analysis

Anchors

Foundations for transmission line towers and tower erection; transmission towers and tower steel anchors set in earth. J. B. Leeper. il Am Inst E E Pro 34:1179-85 Je '15; Abstract. Elec W 66:9-10 Jl 3 '15

Torsional strengths of guy anchor rods. T. Croft. diags Elec W 65:1607-9 Je 19 '15

Anemometer

Best way to take anemometer readings: committee report. Am Soc Heat & V E 19:202-7

Calibration of anemometers, D. A. Hackett, Colliery 36:66-7 S '15

Anesthetics

Apparatus for mechanical administration anaesthetics, il Sci Am 113:471+ N 27'1

Nature our most available and reliable a W: B. Hidden. Sci Am 112:309 Ap 3 '15

Rate of evaporation of ether from oils and its application in oil-ether colonic anesthesia. C: Baskerville. J Ind & Eng Chem 7:868-70 O'15

Twilight sleep in the light of day. Sci Am S 79:112 F 13 '15

Angle-sheave frames

esign of angle-sheave frames. F. L. Burr. Eng & Min J 99:359-64, 403-8 F 20-27 '15

Angle trisection. See Trisection of angles

Chords of angles from one to ninety degrees. S. L. Cook. Foundry 43:416a O '15

Anhydrite

Occurrence of anhydrite in the United States. A. F. Rogers. il Sch Mines Q 36:123-42 Ja '15

Anhydrous hydrazine, See Hydrazine

Testing aniline oil and salt. L: J. Matos. diags Textile World 49:555-6 Ag '15

Aniline colors. See Coal-tar colors

Animal charcoal

Absorption of glucose by bone-black. H. Morton. Am Chem Soc J 36:1832-8 S '14

Animal intelligence

Recent experiments on vision in animals. H. M. Johnson, bibliog Illum Eng Soc 10: 502-14 no 6 '15

Thinking animals. Sci Am S 79:119 F 20 '15

Visual pattern-discrimination in the verte-brates; difference-threshold for band-width in the monkey and the domestic chick. H. M. Johnson. J Fr Inst 180:238-40 Ag '15

Animal products

See also Eggs; Meat

Animals, Habits and behavior of Study of animal and human behavior. L. K. Hirshberg. il Sci Am 112:491-2 My 29 '15

Animals, Treatment of
Animal life in a zoo. A. Pope. il Sci Am
112:385+ Ap 24 '15

Annapolis short line
From a.c. to d.c. in the night, il diags Elec
Ry J 45:542-50 Mr 20 '15

Annealing

Annealing brass for forming and drawing operations. H. W. Dunbar. il Mach 21:560-1

Mr '15
Annealing car wheels. W. J. Keep. Foundry
43:187-8 My '15
Annealing effect on light gray iron castings.
G. S. Evans. il Foundry 43:219-21 Je '15
Annealing gray iron castings. il Foundry 43:
188 My '15

Annealing of brass, F. Johnson, il Metal Ind n s 13:65-7 F '15

Annealing of brass cartridge cases. L. J. Krom, il diags Metal Ind n s 13:359-63 S '15 Annealing oven for tires. W. E. Grum-Gri-mailo. diags Iron Age 94:1397 D 17 '14 Care of chains. Eng & Contr 44:230-1 S 22 '15

Electric annealing furnaces. Iron Age 95:1017 My 6 '15

Importance of annealing steel castings, Iron Age 96:128-30 Jl 15 '15

Industrial uses of gas. H. M. Thornton, il Am Gas Light J 103:19 Jl 12 '15 Recommended practice for the annealing of carbon-steel castings. Foundry 43:102a Mr

annealing box. diag Iron Tr R 57:

445 S 2 '15 Researches in annealing malleable cast O. W. Storey. il Foundry 42:474-8 D '14 castings.

Scale-burnt malleable castings. R: Moldenke. Foundry 43:382 S '15 See also Glass; Steel

Announcements (printing)

Announcements and invitations. Inland Ptr 55:656a-656h Ag '15

Annuities

Annuities and bond discount. O: A. Spies. J Account 20:203-15 S'15

Annuities and bond discount. R. J. Bennett. J Account 19:405-24 Je '15

Antennas. See Wireless telegraph

Anthracite coal, See Coal

Anthraquinone

Separation of mono-β-, 2,6- and 2,7- sulfonic acids of anthraquinone, M. L. Crossley. Am Chem Soc J 37:2178-81 S '15

Anthropogeography

Problems of geographic influence. A. P. Brigham. Sci Am S 79:374; 80:10-11, 19, 38-9 Je 12, Jl 3-17 '15

Anthropology

Exhibitions

Man's development illustrated at San Diego; busts depict the earliest known human be-ings. A. H: Wright. il Sci Am S 80:332 N 20 '15

Anthropometry

Scientist and the athlete; the physiological laboratory of the French military school at Joinville. J. Boyer. il Sci Am S 79:292 My

See also Identification

Anti-dumping law. See Tariff; Tariff-Canada Antimony

Antimony mining in Bolivia. Eng & Min J 100:796 N 13 '15

Antimony production of the world. Eng & Min J 100:277-8 Ag 14 '15

Electrolytic antimony refining. A. G. Met & Chem Eng 13:848-51 N 15 '15

Use of hydrofluoric acid in the separation of copper and lead from tin and antimony by means of the electric current. L. W. McCay. Am Chem Soc J 36:2375-81 N '14

See also Jamesonite

Antipyrin Estimation of caffeine and antipyrin in admixture. W. O. Emery and S. Palkin, J Ind & Eng Chem 7:519-21 Je '15 Antiseptics

New surgical antiseptic; hypochlorites. Sci Am 113:164 Ag 21 '15 Quinine in the treatment of gaseous gangrene. K. Taylor. Sci Am S 80:242-3 O 16 '15

See also Disinfection and disinfectants

Apartment houses

partment houses Apartment house, 11 East Chase street, Baltimore, Md.; views and plan. Brickb 24:pl 120 Ag '15

Apartment house, 405 Park avenue, New York; views and plans. Brickb 24:pl 61-3

My '15

My '15

Apartment house, North street, Buffalo; views and plans. Brickb 24:pl 99-100 Jl '15

Competition for a two-apartment house, il plans Brickb 24:202-6 Ag '15

Craig apartments, 58th street and Monroe avenue, Chicago, Ill.; view and plans. Brickb 24:pl 97-8 Jl '16

Four-family house of stucco finish, il plan Bldg Age 37:29-30 Ag '15

Popular bungalow-court idea; layout and description of St. Francis court at Pasadena, Cal. C: A. Byers. il diags plans Bldg Age 37:19-22 Ap '15

Semi-detached four-family house, il plans Bldg Age 37:42-4 Jl '15

World's costliest apartments, plan Bldg Age 37:68-9 Je '15

See also Duplex houses

See also Duplex houses

Apex law. See Mining laws

Apple syrup

pple syrup and concentrated cider. Sci Am S 80:78-9 Jl 31 '15

Appraising. See Valuation

Apprentices

Apprentices

Apprentice system at the Lynn works of the General electric company. T. Bodde. Gen Elec R 18:35-7 Ja '15

Apprentice work in steel plants. B. W. Gilson. Iron Tr R 55:1138+ D 17 '14

Brown & Sharpe apprenticeship system. Iron Age 96:440 Ag 19 '15

Does modern apprenticeship pay? L. L. Park. Ry Age (Mech ed) 89:248 My '15

Educating sheet metal workers' apprentices. O. E. Cluss. Metal Work 83:827 Je 4 '15

Helping the apprentice. H. E. Blackburn. Ry Age (Mech ed) 89:582-3 N '15

How can you help the apprentice? prize letter and others received in competition. Ry Age (Mech ed) 89:531-2 O '15

Start the apprentice right, Ry Age (Mech ed) 89:555-6 N '15

Training for the industrial side of engineer-

89:585-6 N '15
Training for the industrial side of engineering. A. P. M. Fleming. Inst E E J 53:566-73; Discussion. 53:574-86 Ap 15 '15
Training the apprentice. H. Hillman. il Inland Ptr 55:820-2 S '15
Training the master plumber's apprentice. W. A. Fink. Metal Work 83:888-9; 84:30-1
Je 18, JI 2 '15

Vorks apprentice school discontinued, Iron Age 95:1334-5 Je 17 '15

See also Corporation schools; Industrial education; Schools and shops, Cooperation of

Aquariums

Aquarium and winter house for birds for the city of Boston. W: D. Austin. il plans Brickb 24:47-50 F '15 Collections of the New York aquarium. R. W. Shufeldt. il Sci Am S 80:52-3 Jl 24 '15

Aqueducts

Bradford waterworks, il plan maps Engineer 119:251-4, 278-80 Mr 12-19 '15

Construction features of the Greater Winnipeg water works. J. H. Fuertes. diags Eng & Contr 44:377-80 N 10 '15
Curves on Winnipeg aqueduct built with straight sections of forms. il diags Eng Rec 72:657-8 N 27 '15

esign and construction of the new supply conduit (Nepaug) of the Hartford, Conn., water works. C. M. Saville, Eng & Contr 43: 23-6 Ja 13 '15

Direct control over construction materials is feature of 100-mile Winnipeg aqueduct. il Eng Rec 71:594-6 My 8 '15

Hydrostatic catenary flume on a concrete aqueduct. H. B. Muckleston, il diags map Eng N 74:58-63 Jl 8 '15 Method and cost of making test borings for the Winnipeg Shoal lake aqueduct. D. L. McLean, il diags Eng & Contr 43:316-18 Ap

Progress on the Greater Winnipeg aqueduct. il Eng N 73:230-1 F 4 '15
Roman aqueduct near Tarragona, Spain. J: R. Rippey, il diag Eng N 74:51 JI 8 '15

See also Catskill aqueduct; Los Angeles aqueduct

Cost

Unit bidding prices of contractors awarded construction of 85-mile concrete aqueduct, Winnipeg, Man. Eng & Contr 42:sup32 O

Aquitania (steamship)
Electricity on board ship. J. Lowson. Elec R
& W Elec'n 65:1189 D 19 '14

Aramean language

How we got our alphabet. W. Rice. Inland Ptr 54:508-9 Ja '15

Arbitration, Industrial

rbitration, Industrial Arbitration award in enginemen's wage controversy; text. Ry Age 58:962-5 My 7 '15 Arbitration of Albany strike. Elec Ry J 46: 460 S 11 '15 Arbitration of western engineers' and firemen's demands. Ry Age 57:1043-4, 1084-5, 1123-4; 58:97-8, 125-7, 198-200, 232-4, 264-6, 307-10, 363-5, 409-11, 448, 751-2 D 4-18 '14, Ja 15-Mr 12, Ap 2 '15

363-5, 409-11, 448, 751-2 D 4-18 '14, Ja 15-Mr 12, Ap 2 '15
Award of arbitrators in the western wage controversy. Ry R 56:624-5 My 8 '15
Bay State street railway arbitration. Elec Ry J 45:708-10, 854, 1019-21, 1205-6 Ap 10, My 1, 29, Je 26 '15
Chicago arbitration. Elec Ry J 45:1128; 46:34, 75-6 Je 12, J1 3-10 '15
Chicago arbitration award. Elec Ry J 46:118 J1 17 '15
Chicago 's two-day strike Elec Ry J 45:1165 8

Chicago's two-day strike. Elec Ry J 45:1165-8 Je 19 '15

Je 19 15 Disturbance over the western arbitration. Ry Age 58:959-60 My 7 '15 Employees receive increase in Chicago. Elec Ry J 46:146-9 Jl 24 '15 Holyoke arbitration. Elec Ry J 46:883 O 23 '15

Holyoke arbitration. Elec Ry J 46:883 O 23 '15 Industrial mediation and conciliation. J. Kruttschnitt. Ry R 56:636-7 My 8 '15; Excerpts. Ry Age 58:1126-7 My 28 '15 Joliet, Ill., arbitration decision rendered. Elec Ry J 46:1003 N 13 '15

Labor and arbitration. Elec Ry J 46:174-5 Jl 31 '15

Public regulation of wages of railway em-ployees. F. H. Dixon. Ry Age 58:929-32 Ap

Rhode Island wage arbitration. Elec Ry J 46: 903-5 O 30 '15

Syracuse arbitration. Elec Ry J 45:999 My 22

See also Labor and capital

Arbitration and award
Arbitration provision for building contracts.
E. T. Thurston. Eng & Contr 43:199 Mr 3 Arc, Electric. See Electric arc

Arc lamps. See Electric lamps, Arc

Arc phenomena. A. G. Collis. il diags Am Inst E E Pro 34:2081-2100 S '15

Arched bridges. See Bridges, Arched

Archeology

Ancient relics unearthed in war trenches. il Sci Am 113:342 O 16 '15 Curiosities of bygone ages: relics from New Mexico and from Bible lands. il Sci Am 112: 87+ Ja 23 '15

See also Inscriptions; Monuments; Temples

Arches

Arched reinforced-concrete conduits designed by the theory of least work. W. M. Smith. Eng Rec 71:648-52 My 22 '15

Arching in collieries, R. G. Clark, diags Colliery 35:292-6 Ja '15
Design methods in concrete construction—arches with fixed ends. A. M. Wolf, diags Concrete Cem 7:137-44 O '15

Arches-Continued

Discussion of the essentials of design of reinforced arch structures, diags Concrete Cem 5:239-41 D '14

5:233:41 D '14
Field methods in concrete construction—arch
centers; design and construction. J. Cochran. Concrete Cem 7:107-10 S '15
First reinforced concrete arch in America.
J. W. Pearl, diag Concrete Cem 7:75-6 Ag

Graphical analysis of arches with fixed ends greatly simplified, C. S. Whitney. Eng Rec 72:324-6 S 11 '15
Lake Erie & Eastern R. R.; concrete arch at Mahoning avenue, Youngstown, il plan Ry R 57:131-7 J1 31 '15

57:131-5 Jt 31 '15 Method for determining two-hinged arch re-actions, C. S. Whitney, Eng & Contr 44; 123-4 Ag 18 '15

123-4 Ag 18 '15
Reinforced-concrete conduit analysis simplified by theory of displacements, C. S. Whitney, Eng Rec 72:486-8 O 16 '15
Simple method of determining the stresses in concrete arches due to temperature and rib shortening, H. R. Thayer, Eng & Contr 44: concrete shortening. H

Theory of the arch in mining. B. S. Randolph. Colliery 35:427-9 Mr '15

See also Architecture; Bric Culverts; Strains and stresses Bridges. Arched;

Architects

rchitects
Architect and the client. O. La Farge. Am Inst
Archi J 2:557-9 D '11
Architect and the public. W: L. Steele. Am
Inst Arch J 3:492-5 N '15
Architect's part in the world's work. F: L.
Ackerman. Arch Rec 37:149-58 F '15
As he is known, being brief sketches of contemporary members of the architectural profession. pors Bricklo 21:25-6 Ja '15
Circular of advice relative to principles of the professional practice and the canons of ethics of architects. Am Inst Arch J 3:103
Mr '15
Elye orders of architects. Bldg Age 37:31

Five of orders of architects. Bldg Age 37:31; Professional and other incompetence, Am Inst

Arch J 3:73-5 F '15
Relation of the architect and the engineer.
D. D. Kimball, Heat & Ven 12:13-18 Mr; 26-30 Ap '15
See also Burnham, D. H.; Vaudremer,

Emile; Ware, W: R.

Fees: a reductio ad absurdum. T. Thumtack. Arch & Bldg 46:418-20 N '14

Admission to practice: the proposed law in Victoria, New South Wales. Am Inst Arch J 3:10-1 Jn '15
Architects as independent contractors. A. L. H. Street. Bldg Age 37:64-5 N '15
Right to lien for plans not used. A. L. II, Street. Bldg Age 37:57-8 Mr '15

Sec also Architects -Licenses

#### Licenses

Architects' license law in Illinois. Eng N 73: 500-1 Mr 11 '15
Architect's license law in Illinois. A. Allen. Eng N 73:644-5 Ap 1 '15
Architects must be registered in New York. Eng Rec 71:706 Je 5 '15
Architects versus engineers; Illinois engineers win fight for legal recognition. Assn Eng Soc J 54:277-99 Je '15
Effect of architects' license laws upon engineers. Eng N 73:382-3 F 25 '15
Ulipois law admitting to practice defended.

Illinois law admitting to practice defended. P: B. Wight. Am Inst Arch J 3:87-8 F '15 Registration and licensing of architects. Am Inst Arch J 2:575-7 D '14

Registration law aims solely at raising pro-fessional standards. D. E. Waid, Eng Rec 71:743 Je 12 '15

Report of the Illinois state board of examiners of architects, F. M. Barton. Eng & Contr 42:411-12 O 28 '14

Architectural acoustics. See Acoustics, Architectural

Architectural competitions. See Architecture-Competitions

Architectural draughtsmen: John Ruskin, H Winslow, il Am Inst Arch J 3:406-20 O '15 Architectural draughtsmen: Richard Parke Bonington, H: Winslow, il Am Inst Arch : 3:159-67 Ap '15

Architectural drawing Elementary perspective drawing. G: W. Kitt-redge. il Bldg Age 87:30-2 Ap; 31-3 My: 24 6 Je; 25-8 JI; 24-6 Ag; 35-8 S; 32-4 O '11 (to be cont)

See also Architectural rendering; Architecture—Details; Blue prints; Mechanica drawing

Architectural education

American schools of architecture, E. R. Bossange, Am Inst Arch J 3:105-12 Mr '15 Education, C. G. La Farge. Am Inst Arch : 3:119-20 Mr '15

Architectural Ironwork. See Ironwork, Archi tectural

Architectural rendering Comparison of French, English, and German work, il Brickb 23:301-4 D '14

Architectural societies
First architectural society in America. R. W
Haddon. Arch Rec 38:287-8 Ag '15

Art through the emancipation of the work-man, R. A. Cram. Am Inst Arch J 3:242-1 Je '15

Battle with chaos; the architectural side of city planning. F. L. Ackerman. Am Ins Arch J 3:444-7 O '15

Concrete: a medium of aesthetic expression I. K. Pond. Concrete Cem 6:119-20 Mr '16

Dead hand in architecture (Middle course) R: F. Bach. Brickb 24:153-5 Je '15

Influence on architecture of the condition of the worker by T: S. Attlee. Review by F: L. Ackerman. Am Inst Arch J 2:547-55 D '14

Point of view in approaching the study of architecture. C: H. Bebb, Am Inst Arch J 3:200-2 My '15

architecture. C: H. Bebb. Am Inst Arch J 3:200-2 My '15

See also Acoustics, Architectural; Arches; Architects; Architectural drawing; Architectural rendering; Armories; Art; Art galleries; Auditoriums; Bank buildings; Baths Public; Bridge portals; Bridges; Building Building materials; Buildings; Capitol buildings; Castles; Ceilings; Chimneys; Church architecture; Clubhouses; College architecture; Color in architecture; Columns; Concrete construction; Convalescent homes; Doors; Doorways; Factories; Farm buildings; Fireplaces; Fireproof construction; Floors; Foundations; Fraternity houses; Garages; Gateways; Grain elevators; Greenhouses; Gymnasiums; Heating; High buildings; Hospitals; Hotels; Industrial buildings; Inonwork, Architectural; Library architecture; Lodges; Loft buildings; Machine shops; Market buildings; Marquise (architecture); Masonic temples; Masonry; Mills and millwork; Monuments; Moving picture theaters; Municipal buildings; Mural painting and decoration; Naval architecture; Newspaper offices; Office buildings; Railings; Partitions; Pergolas; Plumbing; Printing offices; Public comfort stations; Railings; Railroads—Buildings; Railroads—Stations; Roofs; Schoolhouses; Stairways; Steel construction; Store fronts; Strairs and Railings; Railroads—Buildings; Railroads—Stations; Roofs; Schoolhouses; Sheet metal work, Architectural; Stables; Stairways; Steel construction; Store fronts; Strains and stresses; Strength of materials; Tea rooms and tea houses; Temples; Theaters; Tiles; Towers; Trusses; Ventilation; Walls; Warehouses; Windows; Young women's Christian association buildings association buildings

#### Bibliography

Books on medieval architecture. R: F. Bach. Arch Rec 37:474-8, 563-6 My-Je '15

Current index of architectural literature. See monthly numbers of Journal of the American institute of architects

Architecture — Continued

Competitions

School building in Michigan and Connecticut. Am Inst Arch J 3:437-8 O '15 Society of Beaux-arts architects: awards. See monthly numbers of Journal of the American institute of architects

## Contracts

See Building contracts

Designs and plans

Work of Burnham & Root, D. H. Burnham, D. H. Burnham & co. and Graham, Burn-ham & co. A. N. Rebori, il plans Arch Rec 38:32-168 Jl '15

#### Details

Early American architectural details: Tucker-Rice porch, Salem, Mass. Brickb 24:pl 1 Ja '15

Villa Madama: text and measured drawings by Howard W. Germann. il Arch Rec 37:26-47

See also Ceilings; Doorways; Stairways

Study and teaching

See Architectural education

Belgium

Architect's impressions in Belgium. E. T. Richmond. il Am Inst Arch J 3:153-8 Ap '15 Belgium and some of its buildings. J: Y. Dunlop. il Bldg Age 37:33-6 Ap '15

Destruction of architectural monuments in Belgium. R. A. Cram. Am Inst Arch J 3: 185-6 Ap '15

Report of a German commission upon the destruction of architectural monuments in Belgium. R. D. Kohn. Am Inst Arch J 3:130-2 Mr '15

France

ean Louis Pascal—institute gold medalist, 1913. W. Cook. il Am Inst Arch J 3:19-26 Ja '15

#### Germany

Modern German architecture, I. K. Pond. il Brickb 24:213-16, 243-7 S-O '15

Great Britain

Monumental classic architecture in Great Britain and Ireland during the 18th and 19th centuries by A. E. Richardson, Review by J.: G. Howard, Am Inst Arch J 3:27-9 Ja '15

#### Mexico

Phases of Spanish colonial architecture. M. Wilcox. il Arch Rec 37:535-46 Je '15

Phases of Spanish colonial architecture. M. Wilcox, il Arch Rec 37:535-46 Je '15

#### Spain

Some old and unfamiliar Spanish buildings. A. G. Byne. il Brickb 23:58-61, 106-9, 226-9, 249-52; 24:43-6, 85-8 Mr, My, S-O '14, F, Ap

#### United States

Fork of Burnham & Root, D. H. Burnham, D. H. Burnham & Root, D. H. Burnham & co. and Graham, Burnham & co. A. N. Rebori. il plans Arch Rec 38:32-168 Jl '15

See also Architecture, Colonial; Architecture, Domestic—United States

Virginia

Early architecture of the Rappahannock valley; Cleve manor. F. C. Baldwin, il diags plan Am Inst Arch J 3:234-40 Je '15

Early architecture of the Rappahannock valley; Gay Mont and Belle Grove. F. C. Baldwin, il diag plans Am Inst Arch J 3:328-36 Ag '15

Early architecture of the valley of the Rap-pahannock: Kenmore. F. C. Baldwin, il plan Am Inst Arch J 3:113-18 Mr '15

Architecture, American. See Architecture-United States; Architecture, Colonial

Architecture, Ancient
Mysterious Baalbek, whose magnificent temples show the hands of many ages and nations. Mrs. T: E. LePage, il Sci Am S'78: 407-10 D 26'14

Architecture, Colonial

Colonial architecture in Connecticut. W. S. Bessell. il diags Arch Rec 37:360-9, 445-52, 547-56; 38:672-80 Ap-Je, D '15 Early architecture of the valley of the Rappahannock. F. C. Baldwin. il diags plans Am Inst Arch J 3:113-18, 234-40, 328-36 Mr, Je, Modern Coloriel.

Ag '15
Modern colonial doorways, B. Griswold, il
Arch Rec 38:246-52 Ag '15
Seventeenth century New England house at
Topsfield, Mass. D. Millar, il plans Arch Rec
38:348-61 S '15
Stairways in houses of moderate cost; colonial
type of stairway. J; T. Fallon, il diags plans
Brickb 24:159-63 Jl '15
Three types of Georgian architecture; the over

Three types of Georgian architecture: the evolution of the style in Philadelphia. H. D. Eberlein. il diags Arch Rec 37:159-76 F '15

#### Bibliography

Books on colonial architecture. R: F. Bach. bibliog Arch Rec. 38:281-6, 379-82, 592-4, 690-3 Ag-S, N-D '15 (to be cont)

Architecture, Domestic
Trend of modern home building; tendency
toward fireproof construction. il plans Bldg
Age 37:71-2 D '15

See also Apartment houses; Bungalows; China closets; Concrete houses; Cottages; Country houses; Doorways; Duplex houses; Farm buildings; Farmhouses; Fireplaces; Fraternity houses; Heating; House decoration; Housing problem; Lodges; Plumbing; Stairways; Stucco; Window seats

Designs and plans

Architect's country house: residence of Elec-tus Litchfield, New Canaan, Conn. H. T. Bottomley. il diags Arch Rec 37:48-63 Ja

Architectural design as an aid to real estate promotion; principles of group planning applied to small suburban houses, Jamaica, L. I. G. H. Irving. il plans Brickb 23:295-6, pl 191-2 D '14

Attractive home for the suburbs. il diags plans Bldg Age 37:19-28 F '15

Country house architecture in the East. E. D. Litchfield. il plans Arch Rec 38:452-88 O '15

Country house architecture in the middle West. P. B. Wight. il plans Arch Rec 38: 385-421 O '15

Country house architecture on the Pacific coast. L: C. Mullgardt. il plans Arch Rec 38:423-51 O '15

Country house built of concrete, il diags plans

38:423-51 O '15
Country house built of concrete, il diags plans Bldg Age 37:42-4 F '15
Country house with clapboard walls, il diags plans Bldg Age 37:42-5 Ja '15
Country house with stucco walls, il diags plans Bldg Age 37:42-5 Mr '15
Design for a six-room country house, il diags Bldg Age 37:42-5 D '15
Double house for a 50 ft. lot, il plans Bldg Age 37:42-5 D '15
Double house for a 50 ft. lot, il plans Bldg Age 37:42-6 D. C. G: B. Ford, il plans Am Inst Arch J 3:352-7 Ag '15
Examples of the work of Otis & Clark, H. Croly, il plans Arch Rec 37:385-409 My '15

H. Croiy. It plans Arcti Rec 57:303-103 May '15

Five-room stucco finished cottage. il plans Bldg Age 37:42-5 O '15

Hollow tile house with shingle roof, il diags plans Bldg Age 37:42-5 My '15

House at Jamestown, N. Y. il plans Arch & Bldg 47:268 Ji '15

House of N. P. Hallowell, Esq., Readville, Mass., house of Miss E. Watson, Gedney Farms and others; views and plans. Brickb 23:pl 185-90 D '14

House of S. W. Labrot, Esq., Annapolis, Md. Brickb 24:pl 121-3 S '15

Houses of Charles A. Cass, Ardsley Park, N. Y. and G. S. Mandell, Hamilton, Mass. Brickb 24:pl 8-13 Ja '15

Houses of Charles Paxton, Lake Forest, Ill., and others. Brickb 24:pl 76-85 Je '15

Architecture, Domestic—Designs—Continued
Houses of Guilford, Baltimore, Md.; views and
plans Brickb 24:223-7, pl 124-35 S '15
Houses of James Parmelee, Washington, D. C.,
and others. Brickb 24:pl 66-75 My '15
Houses of T: C. Dennehy, Esq., Mrs. E. S.
Hood and others; views and plans. Brickb
24:pl 23-30 F '15
Low cost cottage with shingle roof intended

24:pl 23-30 F '15'
Low cost cottage with shingle roof intended for erection on a lot having forty feet frontage. il diags plans Bldg Age 37:42-5 S '15 Modern version of the early Pennsylvania country house. C. M. Price. il plans Arch Rec 37:76-81 Ja '15
Portfolio of current architecture. il Arch Rec 37:371-8, 465-9; 38:663-71 Ap-My, D '15
Progressive architectural construction. F: Squires. Arch & Bldg 47:sup1-2 Jl '15
Residence design. il plans Arch & Bldg 47: 78-81 F '15
Residence of an Illinois architect, il diags plans Bldg Age 37:19-25 D '15

Residence of an Illinois architect, il diags plans Bldg Age 37:19-25 D '15
Residence of Charles S. Walton, Esq. R. D. Murray. Arch Rec 38:501-23 N '15
Residence of F. E. Drury, Esq., Cleveland, Ohio. I. T. Frary. il plans Arch Rec 38:601-14 D '15
Residence of S.

Residence of S. Harkness, Esq., Goshen Point, near New London, Conn. il plans Arch &

14 D '15
Residence of S. Harkness, Esq., Goshen Point, near New London, Conn. il plans Arch & Bldg 47:378a O '15
Residences designed by Rowe & Smith. il Arch & Bldg 47:306-14 Ag '15
Stone dwelling for the suburbs. il plans Bldg Age 37:42-5 Je '15
Suburban home of tile and stucco. il plans Bldg Age 37:19-24 My '15
Suburban house of stucco finish. il diags plans Bldg Age 37:19-24 My '15
Two-family house at East Orange, N. J. il plans Bldg Age 37:61-2 Je '15
Two-family house at East Orange, N. J. il plans Bldg Age 37:61-2 Je '15
Week-end house at Ardsley, N. Y. of Adolph Lewisohn, Esq. Arch Rec 38:177-83 Jl '15
Week-end house at Ardsley, N. Y. of Adolph Lewisohn, Esq. Arch Rec 38:177-83 Jl '15
Yama Shiro, the Japanese villa of Adolph L. and Eugene Bernheimer. F. M. Small. il plan Arch & Bldg 47:212-20 Je '15

#### England

Old timbered houses: examples of old post and plaster work of the 15th and the 16th centuries, il Bldg Age 37:65-6 Ag '15

## Italy

Villa Madama: text and measured drawings by Howard W. Germann, il Arch Rec 36: 500-10; 37:26-47 D '14-Ja '15

#### United States

Architectural reclamation of small areas in cities, H. D. Eberlein, il Arch Rec 37:1-25 Ja '15 Ja

Ja '15
Colonial architecture in Connecticut. W. S.
Bessell. il Arch Rec 37:360-9, 445-52, 54756; 38:672-80 Ap-Je, D '15
Country house architecture in the East. E. D.
Litchfield. il plans Arch Rec 38:452-88 O '15
Country house architecture in the middle
West. P: B. Wight. il plans Arch Rec 38:
385-421 O '15
Country house 'architecture on the Pacific
coast. L: C. Mullgardt. il plans Arch Rec
38:423-51 O '15
Early architecture of the real-

Early architecture of the valley of the Rappa-hannock, F. C. Baldwin, il diags plans Am Inst Arch J 3:113-18, 234-40, 328-36 Mr, Je,

Ag '15
House of Arthur A. Fowler, Esq. E. V. Meeks, il plans Arch Rec 38:192-205 Ag '15
Recent interiors by Thornton Chard; views. Arch Rec 37:177-86 F '15
Residence construction in Indiana. J. F. Hobart, il plans Bldg Age 37:47-52 O '15
Residence of Charles S. Walton, Esq. R. D. Murray, il plans Arch Rec 38:501-23 N '15
Seventeenth century New England house at Topsfield, Mass. D. Millar, il plans Arch Rec 38:348-61 S '15
Stuart Duncan residence at Newport, H. Croly.

38:348-31 S 13 Stuart Duncan residence at Newport. H. Croly, il plan Arch Rec 38:289-309 S '15 Three types of Georgian architecture: the evo-lution of the style in Philadelphia. H. D. Eberlein, il diags Arch Rec 37:159-76 F '15

Architecture, Ecclesiastical, See Church archi tecture

Architecture, Greek Greek refinements; studies in temperamenta architecture, by W: H: Goodyear. Review Arch Rec 37:281-6 Mr '15

Architecture, Japanese Yama Shiro, the Japanese villa of Adolph L and Eugene Bernheimer, F. M. Small, i plan Arch & Bldg 47:212-20 Je '15

Architecture, Medieval Books on medieval architecture. R: F. Bach Arch Rec 37:474-8, 563-6 My-Je '15

Architecture, Roman Roman architecture and its critics. A. D. F Hamlin. il Arch Rec 37:425-36, 493-515 My

Architecture, Rural. See Country houses: Farn

Architecture, Spanis Panama-California

chitecture, Spanish anama-California exposition, San Diego California; Bertram G. Goodhue and the renaissance of Spanish-colonial architecture. C. M. Price, il plan Arch Rec 37:229 hases of Cravita Diego

51 Mr '15
Phases of Spanish colonial architecture. M
Wilcox. il Arch Rec 37:535-46 Je '15 See also Architecture-Spain

Arctic exploration

Astronomy in the Arctic, R. W. Porter, Sc Am S 79:39 Ja 16 '15 Capt. Brussilov's Arctic expedition. Sci Am 112:201 F 27 '15 Crocker land expedition. Sci Am 111:489 D 12

'14
Food for polar explorers. E. Shackleton. Sc. Am S 79:36-7 Ja 16 '15
Relics from the second Grinnell expedition Sci Am S 79:300 My 8 '15
Stefánsson's new found land. H. J. Spinden. il map Sci Am 113:289+ O 2 '15
Who will rescue the lost explorers? Sci Am 112:180 F 20 '15

Area measurement

Reducing decimals of an acre to square feet; table. C. H. Eiffert. Eng N 74:702 O 7 '15 Reducing square feet to decimals of acres. Eng N 74:363 Ag 19 '15

Argentina

Banking and credit in Argentina, Brazil, Chile, and Peru. E: N. Hurley. U S Bur For & Dom Com 90:1-72 '14 Electrical conditions in Buenos Aires and Argentina. Elec R & W Elec'n 66:124-6 Ja

Financial developments in South American countries, W: H. Lough, U S Bur For & Dom Com 103:7-15 '15 Making friends with the South Americans. R. S. Naon, il Metal Work 83:377-80 Mr 12 '15

#### Commerce

Argentina's need is America's opportunity. Metal Work 84:428 O 1 '15

otton textiles in Argentina. Textile World 49:318-21, 414-17 Je-Jl '15

Outlook for American goods in Argentina. A. E. de Hoch. Am Ind 15:30-1 F '15

Pan-American trade—Argentina. A. M. Boggs. maps Am Ind 16:20-3 O '15

#### Sanitary affairs

Water supply and drainage in Argentina. Dale. il Metal Work 84:103-6 Jl 23 '15

Notes on the noble gases. W. S. Andrews. Gen Elec R 18:226 Mr '15

Arithmetic

See also Mensuration; Multiplication

#### Study and teaching

Teaching arithmetic with the selling price as a base for figuring profits. Dom Eng 72:170 a base 1 Ag 7 '15

Arithmetic, Commercial

See also Calculating machines; Discount; Interest

Arithmetical machines. See Calculating machines

#### Arizona

Industries and resources

Arizona in 1914; mining industries. map Eng & Min J 99:105-7 Ja 9 '15 Valuation of Arizona's producing mines. Eng & Min J 100:469 S 18 '15

& Min J 100:469 S 18 '15

Arizona copper company
Cost of cars, electric locomotives, etc., for
Arizona copper co.'s new smeltery, diags
Eng & Min J 99:495 Mr 13 '15
Design, construction and unit costs of the
power house for the new smelter of the
Arizona copper co., ltd., Clifton, Ariz, diags
plans Eng & Contr 42:262-5 S 16 '14

Unit construction costs from the new smelter
of the Arizona copper co., ltd. E. H. Jones.
diags Am Inst Min E Bul 91:1497-1649 Jl
'14; Abstract. Eng & Contr 42:560-3 D 16
'14

#### Arkansas

Industries and resources

Occurrence and origin of the bauxite deposits of Arkansas. W. J. Mead. pls Econ Geol 10:28-54 Ja '15

Armaments

Invisible man behind the gun. Sci Am 112:46 Ja 9 '15

See also Armies; Navies

Armatures

Direct-current armature winding principles.
J. Gintz, jr. Power 41:335-8 Mr 9 '15
Experimental data concerning the safe

Experimental data concerning the safe operating temperature for mica armature-coil insulation. F. D. Newbury. diags Am Inst E E Pro 34:2555-72 O '15; Abstract. Elec W 66:1205-6 N 27 '15

Incremental armature copper losses at no-load and armature teeth Eddy-current losses. A Press. diags Inst E E J 53:820-3 Je 15 '15

Methods of removing the armature from box frame railway motors. J. L. Booth. il Gen Elec R 18:908-15 S '15

One method of locating faults in an armature. P. M. Blough. Elec R & W Elec'n 66: 342 F 20 '15

Protecting armature coils from cutting on

342 F 20 '15
Protecting armature coils from cutting on band wire. W. A. Ernst. Elec Ry J 46:1089-90 N 27 '15
Rewinding direct-current motors and generators. A. A. Fredericks. diags Power 42:76-8, 116-18, 148-50 JI 20-Ag 3 '15
Slot insulation design, with comparison between the unit dielectric stresses in the slot insulation of a low-voltage alternator and those in a high-voltage machine. H. M. Hobart. Gen Elec R 18:366-71 My '15
Small vs. large 550-volt armatures. B. Dawson. Power 42:422 S 21 '15
Soldering commutators and rotors. G. Fox.

Soldering commutators and rotors, G. Fox. diags Power 42:328-9 S 7 '15

Solenoid and electromagnet windings. G: L. Hedges. Am Inst E E Pro 34:2595-2614 N '15 Space distribution of flux density. A. Still. Elec W 65:1679-82 Je 26 '15

Two-phase and three-phase lap windings in unequal groups, E. M. Tingley, Elec R & W Elec'n 66:166-8 Ja 23 '15

Universal armature machine, il Elec Ry J 46: 412-13 S 4 '15

See also Commutators; Dynamos; Electro-

Armies Clothing a winter army. Sci Am 112:215+ Mr 6 '15

See also Military art and science; Military hygiene; Navies; War

#### Commissariat

Flour moths and army rations. W. P. Pycraft. il Sci Am S 80:333 N 20  $^{\prime}15$ 

Armor plate
Cost of a government armor plate plant. Iron
Age 95:674-5 Mr 25 '15
New Krupp armor plates. Sci Am 113:338 O

New Ki 16 '15

Armories

Drill room, University of Illinois, requires 23,000 square feet of direct radiation. G: B. Rice. il diags Heat & Ven 12:13-23 S '15

End framing for armory at University of Illinois and some general features of this structure. il diags Eng & Contr 43:141-3 15 17

Armour car lines

Private car lines not common carriers. Ry Age 58:1051-2 My 21 '15

Arms and armor

See also Guns; Helmets; Pistols; Rifles

Army rations. See Armies-Commissariat Arrowrock dam

Completion of Arrowrock dam. M. F. Cunningham, il Sci Am 113:343 O 16 '15 Construction of the Arrowrock dam. C: H. Paul, il Boston Soc C E J 2:337-49 N '15 Log-handling equipment at Arrowrock dam. C: H. Paul, diags map Eng N 74:200-1 Jl 29 '15

Messhouse lesshouse management at the Arrowrock dam. R. R. Clawson, il Eng N 73:1201-3 Je 24

Progress on Arrowrock dam. C: H. Paul. il Eng N 73:370-1 F 25 '15

rsenic
Distribution of arsenic in liver tissue in cases of poisoning. L. A. Ryan. Am Chem Soc J 37:1959-60 Ag '15
Electrolytic separation of zinc, copper and iron from arsenic. A. K. Balls and C. C. McDonnell, J Ind & Eng Chem 7:26-9 Ja '15 See also Dipping fluids, Arsenical

Arsenical dipping fluids. See Dipping fluids, Arsenical

Arsenious oxide

rsenious oxide
Arsenious oxide as an alkalimetric standard.
A. W. C. Menzies and F. N. McCarthy. Am
Chem Soc J 37:2021-4 S '15
Vapor pressure of arsenic trioxide. H. V.
Welch and L. H. Duschak, il U S Bur Mines
Tech Pa 81:1-20 '15

Arsenious sulphide Coagulation of arsenious sulfide sol by elec-trolytes. J. Mukhopadhyaya. Am Chem Soc J 37:2024-31 S '15

Ministry of art, by R. A. Cram. Review by R: F. Bach. Arch Rec 37:187-9 F '15

See also Architecture; Decoration and ornament; Design, Decorative; House decoration; Mural painting and decoration; Photography

Art galleries rt galleries
Dedication of the Minneapolis institute of arts.
E. H. Hewitt. Am Inst Arch J 3:85-6 F '15
Montreal art gallery. T: W. Ludlow. il plans
Arch Rec 37:132-48 F '15
Parrish museum, Southampton, Long Island.
C: C. May. il plans Arch Rec 38:524-39 N '15

#### Lighting

Glare in museum galleries; the psychological factor in the lighting problem. B: I. Gilman. diags Arch Rec 38:262-80, 362-78 Ag-S '15 Nitrogen-filled lamps in Boston art museum. il Elec W 66:481-2 Ag 28 '15

Artesian wells

Experience with artesian well water at Elgin, Illinois. R. R. Parkin, Am Water Works Assn J 2:407-9 Je '15

Kynuna wells—a test case of rock pressure. J. W. Gregory, map Econ Geol 9:768-75 D '14

Nethod of the control of the contro

"14 Method of testing verticality of a deep well at Audubon, Iowa. P. F. Hopkins. Eng & Contr 42:559 D 16 '14 Studies of artesian waters in Chicago and surrounding territory. C. B. Anderson and F. W. DeWolf. map Am Water Works Assn J 2:318-23 Je '15 Tidal influence on artesian well at Seattle. H. M. Chittenden. Eng N 74:492 S 9 '15

Artificial daylight. See Daylight, Artificial

Artificial ice. See Ice-Manufacture

Artillery

Field artillery and ammunition. G: B. Jewell.
il diags Eng M 49:698-711 Ag '15
Giant artillery of fifty years ago. Sci Am S
80:80 Jl 31 '15
Mathematics and artillery science. G: Greenhill. Sci Am S 79:143 F 27 '15

Artillery--Continued

Notes on coast artillery hits. E. C. M. Stahl. il diags Sibley J 29:67-78 D '14
Proving grounds for French artillery: a laboratory battlefield. J. Boyer. il Sci Am 113: 116-7. Ag 7 '15

116-7 Ag 7 '15 Spendthrift artillery. Boissonet. Sci Am 113: 408 N 6 '15

See also Gunnery; Guns (ordnance); Naval guns

Artists

Random reflections on artists and scientists. Sci Am 112:229 Mr 6 '15

Ashestos

Asbestos Asbestos in southern Quebec. J: A. Dresser. il Am Inst Min E Bul 93:2267-74 S '14; Discussion. 100:861-3 Ap '15 Corrugated asbestos cement sheets for roofing and siding. diags Eng & Contr 44:214 S 15 '15; Iron Age 96:407 Ag 19 '15; Ry Age 59:537 S 17 '15; Ind Eng 15:103-4 S '15; Am Gas Light J 103:220-1 O 4 '15 Facts about asbestos. Power 42:493 O 5 '15 Growth of the asbestos industry. Textile World 50:128-9 O '15 United States the greatest user of asbestos. Dom Eng 72:270 Ag 28 '15

Ascaridolic acid
Resolution of ascaridolic acid. E. K. Nelson.
Am Chem Soc J 36:2521-2 D '14

Ash

Hickories,

Hickories, elms and ash trees. W. H. Miller. il Am For 21:719-29 Je '15 Use of native woods for interior finish. C. M. Price. il Brickb 24:242 O '15

Ash handling

Ash handling

Ash and refuse dumping board, West 77th st.,

North river, New York city. C. W. Staniford. diags Eng N 73:166-7 Ja 28 '15

Coal and ash handling at the gorge plant of the Northern Ohio traction & light co. A. D. Williams. il diag Power 42:398-400 S 21 '15

Cost of handling ashes with steam vacuum system. R. H. Miller, Power 41:820 Je 15 '15

Cost of operating vacuum ash-handling systems. C. O. Sandstrom; R. H. Miller, Power 41:412 Mr 23 '15

Details of heating and ventilating work; standard designs for ash conveyor hoist and clamps for ash cans. F. G. McCann. diags Metal Work 84:458 O 8 '15

Dredge pump handles ashes. O. D. Havard. diag Power 41:580 Ap 27 '15

Dust-free suction of ashes and slags; abstract. F. Hartmann. Am Soc M E J 37:184-5 Mr '15

Eliminating smoke, soot and dirt in steam generation. il Textile World 49:566-7 Ag '15 Mechanical handling of coal and ashes in the power plant. C. C. Brinley. il diags Eng M 49:872-87; 50:65-77 S-O '15

Ashes. See Ash handling; Coal ashes; Wood

Asphalt

sphalt
Asphaltic materials for road construction. A. A. Berkowitz. Eng & Contr 42:161-3 Ag 12 '14; Same. Munic Eng 47:464-7 D '14
Briquetting plant of the Pacific coast coal co., at Briquetville near Renton, Washington; use of asphalt for binder. C. M. Lewis. il Colliery 35:227-31 D '14
Cementing value of bituminous binders. L. Kirschbraun, il diags J Ind & Eng Chem 6:976-85 D '14; Same. Eng & Contr 43:39-43 Ja 13 '15
Contributions of the chemist to the asphalt

Contributions of the chemist to the asphalt industry. J. L: Rake. J Ind & Eng Chem 7:276 Ap '15

Differentiation of natural and oil asphalts. E. C. Pailler. J Ind & Eng Chem 6:286-9 Ap '14; Same. Eng & Contr 42:347-9 O 7

Interesting application of colloidal chemistry. D. T. Pierce. Met & Chem Eng 13:408-9 Jl

Kentucky rock asphalt road, G. D. Crain, jr. Munic J. 39:365-6 S. 2 '15 Mining Trinidad asphalt, il Eng & Min J 99: 483 Mr 13 '15

Purchase of asphalt and asphaltic cement on the bituminous basis, D. T. Pierce, Eng & Contr 43:160 F 17 '15

Purchase of asphalt and asphaltic cement on the bituminous basis. W. H. Broadhurst. Eng & Contr 43:85-6 Ja 27 '15 Rock asphalt in the Philippines. Munic J 39: 432-3 S 16 '15

See also Bituminous materials; Pavements, Asphalt

Testing

Kansas City, Mo., maintains open asphalt specifications. C. R. Mandigo. il Eng N 74: 642-4 S 30 '15
Practical testing of asphalt and road oil. T. A. Fitch. Eng & Contr 44:367-9 N 10 '15
Testing the consistency of asphalt. il Sci Am 113:236+ S 11 '15

Asphalt plants

Asphalt distributor, il Good Roads n s 10:103 Ag 7 '15 Electricity in stone quarries and asphalt plants, il Elec R & W Elec'n 67:315-18 Ag

Portable asphalt mixing plant, il Good Roads n s 10:58-9 Jl 3 '15

Asphalt plants, Municipal

n s 10:58-9 Jl 3 '15

Asphalt plants, Municipal

Bronx borough asphalt plant. il Munic J 39:
215-16 Ag 12 '15

Camden's municipal asphalt plant. il Munic
J 38:127-9 F 4 '15

City plant uses old asphalt for New York. il

Eng Rec 71:647 My 22 '15

Cost of asphalt repairs in Pittsburg. J: B.

Townley. Munic Eng 48:300 My '15

Harrisburg's municipal asphalt plant. il Munic
J 39:364-5 S 2 '15

Municipal plant reduces asphalt maintenance
cost in New York. H. W. Durham. Eng Rec
71:238-9 F 20 '15

New municipal asphalt plant at Pittsburg.
N. S. Sprague. il Munic Eng 47:460-3 D '14

New municipal asphalt plant for borough of
Manhattan. H: W. Durham. il diag plans
Eng N 73:1074-7 Je 3 '15

Operating Manhattan asphalt plant. W: Goldsmith. il plan Munic J 39:771-3 N 18 '15

Pittsburgh's municipal asphalt plants. il Munic
J 39:141-3 Jl 29 '15

San Francisco municipal asphalt plant. A. J.
Cleary. plans Eng N 73:318-19 F 18 '15

Asphaltic concrete. See Pavements, Bituminous

concrete Asphyxiating gases. See Gases. Asphyxiating

Assaying
Assay of cyanide solutions, lead acetate method, diags Eng & Min J 100:521-2 S 25

Assay of precious metal bullion. F: P. Dewey. Eng & Min J 99:355-8 F 20 '15
Assaying gold-bearing cyanide solutions. D. M. Levy and H. Jones. Eng & Min J 100:150 Jl 24 '15
Determination of platinum, palladium and gold. A. M. Smoot. Eng & Min J 99:700-1 Ap 17 '15
Electrolytic assay of lead. E. A. Lewis. Metal Ind n s 13:463 N '15
Fineness of crushing for assaying. E. J. Hall. Eng & Min J 100:649 O 16 '15
New assay balance. il Met & Chem Eng 13: 512-13 Ag '15
Phosphate method for alumina. F. G. Hawley. Eng & Min J 99:536-7 Mr 20 '15
Ouantitative blowpiping as an aid to the pros-

Quantitative blowpiping as an aid to the prospector. S. Fischer, jr. diags Met & Chem Eng 12:693-5, 771-5 N-D '14

ule governing cupellation losses. W. J. Sharwood. Am Inst Min E Bul 104:1671-5 Ap '15; Excerpts. Met & Chem Eng 13:927 D 15; Discussion. Am Inst Min E Bul 108:2454

See also Gold assaying; Metallurgy

Assembling methods

Assembling motor cars in Packard plant. il Iron Age 96:873-6 O 14 '15

Saving assembly costs. A. A. Dowd. Iron Age 95:238 Ja 28 '15

Assessment

Method of assessing cost of water main extensions by the municipally owned water works of Duluth, Minn. D. A. Reed. Eng & Contr 43:447-8 My 19 '15

Assessment—Continued
Table for making assessments for paving.
D. B. Davis. Eng & Contr 43:447 My 19 '15

Associated advertising clubs of the world 11th annual convention, Chicago, June 20-25. J. T. Elliott. Inland Ptr 55:546-7 Jl '15

Associated engineering societies of St. Louis Regulations. Assn Eng Soc J 54:228-33 My '15 Review. A. P. Greensfelder. Assn Eng Soc J 54:220-7 My '15

Associated garages of America Garage men form national b Age 35:198 F 10 '15 national body, Horseless

Associated manufacturers of electrical supplies Organization. Elec R & W Elec'n 66:480 Mr 13 '15

Supply manufacturers organize. Elec W 65: 693-4 Mr 13 '15

Associated press

Mobilizing news. C: E. Crane. il Sci Am 112: 134-5 F 6 '15

Association and associations

Commercial organizations in France. A. J. Wolfe. U S Bur For & Dom Com 98:1-75 '15 Local association as an educator. Dom Eng 71:128-9 My 1 '15

See also Chambers of commerce; Engineering societies

Association buildings
Young women's Hebrew association, New
York, il Arch & Bldg 47:21-5 Ja '15

Association of Edison illuminating companies 36th annual convention, Spring Lake, N. J., Sept. 13-16. Elec W 66:622-3 S 18 '15

Association of iron and steel electrical engineers 9th annual convention, Detroit, Mich., Sept. 8-11. Elec R & W Elec'n 67:521-4 S 18 '15 9th annual convention, Detroit, Mich., Sept. 8-11. Elec W 66:624 S 18 '15 9th annual convention, Detroit, Mich., Sept. 8-11. Iron Tr R 57:539-41 S 16 '15

Association of railway electrical engineers 8th annual convention, Chicago, Oct. 19-22. Ry Age 59:802-4 O 29 '15 8th annual convention, Chicago, Oct. 19-22. Ry R 57:529-30 O 23 '15

Association of railway telegraph superintend-

ents 34th annual convention, Rochester, N. Y., June 22-24. Ry Age 59:19-20 Jl 2 '15

Association of transportation and car account-

ing officers

My Age 57:1192 D 25 '14

Summer meeting, Niagara Falls, June 22-23.
Ry Age 59:25-6 Jl 2 '15

Astoria tunnel Astoria-Bronx gas tunnel. J. F. Springer, il Munic J 39:649-50 O 28 '15

Astoria tunnel under the East river for gas distribution in New York city, J: V, Davies, il map Am Gas Light J 103:225-30, 244-7+O 11-18 '15

Flooding and recovery of the Astoria tunnel. H. Carpenter, il diags Eng N 74:673-8, 736-41 O 7-14 '15

Astrolabe Prismatic astrolabe; a new instrument for determining latitude and time by equal altitudes. D: Rines. il Eng N 72:754-5 O 8 '14; Same. Sci Am S 78:375 D 12 '14

Astronomical instruments Watching the earth revolve. A. H. Compton. il Sci Am S 79:196-7 Mr 27 '15

See also Astrolabe; Telescope

Astronomical observatories Paris observatory and its work. G: A. Hill. il Sei Am 112:251+ Mr 13 '15

Astronomical research Where the mathematician could aid the astronomer. F. Schlesinger. Sci Am S 80:31-2 Jl 10 '15

Astronomy Measurement of the distances of the stars. F. W. Dyson. Sci Am S 80:162-3, 182 S 11-

F. W. Dyson. Sci Am S 80:162-3, 182 S 11-18 '15 Recent discoveries in astronomy. Sci Am S 80:210 O 2 '15

Sidereal universe. J. S. Plaskett. Sci Am S 80:274-5, 299 O 30-N 6 '15

See also Astronomical instruments; Astronomical observatories; Mechanics, Celestial; Meteorites; Stars

Study and teaching

Celestial globe and tellurian. il Sci Am 113: 61 Jl 17 '15

Atchison.

tchison, Topeka & Santa Fe railroad Mr. Ripley and the Santa Fe family. G. La-throp. Ry R 57:584-5 N 6 '15 Nineteen years' development work on the Santa Fe. map Ry Age 58:1403-6, 1465-8 Je

18-25 '15
Old and the new Santa Fe. C: S. Gleed. Ry R
57:580-2 N 6 '15
Reorganization of the Santa Fe. V: Morawetz.
Ry Age 59:849-50 N 5 '15
Twentieth annual report. map Ry Age 59:6801, 716-18 O 15 '15

Atlanta, Georgia Sewerage

Operating records of Atlanta sewage treatment plant show adequate degree of purification. C: C. Hommon, il Eng Rec 72:4-7

Atlantic cable. See Cables, Submarine

## Atlantic City, New Jersey

#### Hotels

Cold weather construction methods used in erecting Hotel Traymore. D. L. Kneedler. il diags Concrete Cem 7:172-4 N '15 Largest fireproof resort hotel in the world completed at Atlantic City. il diags Eng Rec

72:11-13 Jl 3 '15 New Traymore hotel at Atlantic City. il diags Eng N 74:18-23 Jl 1 '15 Reinforced-concrete frame of hotel Traymore erected at rate of a floor a week, il plans Eng Rec 72:50-1 Jl 10 '15

Atmosphere

Formation of ozone in the upper atmosphere. J. N. Pring. Sci Am S 79:286-7, 303 My 1-8 '15 Measuring atmospheric comfort. il Sci Am 112:431 My 8 '15 See also Air

Atmospheric pressure
Barometer and health. Sci Am 112:380 Ap 24

Atmospheric temperature

Highest and lowest temperatures in the atmosphere. Sci Am 112:49 Ja 9 '15
Man's true thermal environment. G. W. Grabham. Sci Am S 80:219 O 2 '15

Atomic theory Some aspects of the atomic theory, F: Soddy. Sci Am S 80:178-9 S 18 '15 See also Atoms

Atomic weights

Annual report of the International committee on atomic weights, 1915. F. W. Clarke and others. Am Chem Soc J 36:1585-9 Ag '14 Annual report of the International committee on atomic weights, 1916. Am Chem Soc J 37:2449-52 N '15 Atomic weight of cadmium. G. A. Hulett and E. L. Quinn. Am Chem Soc J 37:1997-2000 S '15

Atomic weight of molybdenum. J: H. Müller. diags Am Chem Soc J 37:2046-54 S '15 Atomic weight of tantalum. G: W. Sears and C. W. Balke. diags Am Chem Soc J 37: 833-44 A) '15 Atomic weight.

Atomic weights of lead. Sci Am 111:469 D 5 14

Elements with several atomic weights. Sci Am S 80:39 Jl 17 '15 sodium carbonate and the atomic weight of sodium carbonate and the atomic weight of carbon referred to silver and bromine. T. W. Richards and C: R. Hoover. Am Chem Soc J 37:95-107 Ja '15 Molecular weight of sodium sulfate and the atomic weight of sulfur. T. W: Richards and C: R. Hoover. Am Chem Soc J 37:108-13 Ja '15 Notes. On Society 15 Notes.

otes on sodium columbates; the atomic weight of columbium. E. F. Smith and W. K. Van Haagen, diags Am Chem Soc J 37:1783-97 Ag '15 Notes

Atomic weights -Continued

Periodic law. S. Dushman. Gen Elec R 18: 614-21 Jl '15

Revision of the atomic weight of cadmium: the Revision of the atomic weight of cadmium: the electrolytic determination of cadmium in cadmium chloride. G. P. Baxter and M. L.:
Hartmann. Am Chem Soc J 37:113-31 Ja '15
Revision of the atomic weight of lead: the analysis of lead bromide. G. P. Baxter and T. Thorvaldson. Am Chem Soc J 37:1020-7
My '15

My '15
Revision of the atomic weight of lead: the analysis of lead bromide and chloride. G. P. Baxter and F. L. Grover. il Am Chem Soc J 37:1027-61 My '15
Revision of the atomic weight of praseodymium: the analysis of praseodymium chloride. G. P. Baxter and O. J. Stewart. Am Chem Soc J 37:516-36 Mr '15
Same chemical element may have different atomic weights, Sci Am 112:313 Ap 3 '15
22d annual report of committee on atomic weights; determinations published during 1914. G. P. Baxter. Am Chem Soc J 37: 407-17 Mr '15
Weights of elements. J: Waddell. Sci Am S 80:290-1 N 6 '15

#### Atomizers

dex drilling and tapping attachment for Brown & Sharpe automatic screw machine, W. F. Gradolph. il diags Mach 21:289-90 D Index

#### Atoms

toms and ions. J. J. Thomson. Sci Am S 79:274, 290-1, 310-11, 326-7, 346-7, 362-3 My 1-Je 5 '15 Atoms

1-Je 5 '15
Atoms, molecules and electrons. N. W. Rakestraw. Sci Am S 80:254-6 O 16 '15
Changes of mass and weight involved in the formation of complex atoms. W: D. Harkins and E. D. Wilson. Am Chem Soc J 37: 1367-83 Je '15
Chemical significance of crystalline form. W: Barlow and W: J. Pope. il Am Chem Soc J 36:167-86 Ag '14

Barlow and W: 36:1675-86 Ag '14

36:1675-86 Ag '14
Modern views on the constitution of the atom.
A. S. Eve. il J Fr Inst 179:269-82 Mr '15
Present aspect of the hypothesis of compressible atoms. T. W. Richards. bibliog Am
Chem Soc J 36:2417-39 D '14
Recent evidence for the existence of the
nucleus atom. A. D. Cole. Sci Am S 79:194-5
Mr 27 '15

nucleus atom. A. D.
Mr 27 '15
Recent work on the structure of the atom.
W: D. Harkins and E. D. Wilson. bibliog Am
Chem Soc J 37:1396-1421 Je '15
Remarks concerning the chemical significance
of crystalline form. T. W. Richards. Am
Chem Soc J 36:1686-95 Ag '14
Structure of complex atoms; the hydrogenhelium system. W: D. Harkins and E. D.
Wilson. Am Chem Soc J 37:1383-96 Je '15
What is matter made of? resemblance of the
atom structure to an infinitely small solar
system. A. H. Compton. diags Sci Am 112:

See also Atomic weights; Electrons

Atterberg plasticity method. C: S. J U S Bur Stand Tech Pa 46:1-18 '15 Kinnison. Audion

Audion telephone repeater. F. M. Williamson. Elec W 65:900 Ap 10 '15 Developments of the audion lamp—music from light. Elec R & W Elec'n 67:908-9 N 13 '15 for receiving winds.

Device for receiving wireless time signals. il diag Elec W 65:818-19 Mr 27 '15

Double-audion type of receiver, description of the equipment used for the reception of continuous radiotelegraphic waves at station in North Dakota, A. H. Taylor, Elec W 65:652-5 Mr 13 '15

First public use of the do Forest large sea. W 65:652-5 Mr 13 '15
First public use of the de Forest lamp as an oscillating audion. L. de Forest. il Elec R & W Elec'n 67:908 N 13 '15

Operating features of the audion: explanation of its action as an amplifier, as a detector of high-frequency oscillations and as a valve. E. H. Armstrong. diags Elec W 64:1149-52 D 12 '14

Ultraudion detector for undamped waves. L. de Forest. il Elec R & W Elec'n 66:357-8 F 20 '15; Same. Elec W 65:465-6 F 20 '15

Auditing

Competitive bidding. J Account 20:81-90, 133-Ag

Qualifications in certificates, G: O. May, J Account 20:248-59 O '15 Value of an audited statement. A. G. Moss. J Account 18:455-9 D '14

See also Accounting

Auditoriums

Acoustics of auditoriums; investigation of the acoustical properties of the armory at the University of Illinois. F. R. Watson, bibliog il Ill U Eng Exp Sta Bul 73:1-32 '14; Same. Sci Am S 78:358-9, 380-2 D 5-12 '14

Acoustics of auditoriums; investigation of the acoustical properties of the armory at the University of Illinois, F. R. Watson, il Brickb 24:257-8 O '15

Project for large municipal convention hall in Chicago, il map Ry R 56:100-1 Ja 16 '15

San Francisco's new exposition-civic auditorium, il Elec W 65:313 Ja 30 '15

Ventilation and other features of exposition auditorium at San Francisco, il Eng Rec 71:237-8 F 20 '15

See also Balconies

See also Balconies

Augers Facts about augers and auger bits. E. H. Darville. Bldg Age 37:67-8 Ag '15

#### Austin, Texas

#### Public works

Hollow reinforced-concrete structure replaces dam at Austin, which failed fifteen years ago. il Eng Rec 71:672-3, 707-9, 750-1 My 29-Je 12 '15

Je 12 '15
Hydroelectric development at Austin. il diags
Elec W 65:1460-2 Je 5 '15
New Austin dam and power plant. F. S. Taylor. il Eng & Contr 43:465-7, 492-5, 535-6 My
26-Je 2, 16 '15; Same cond. Elec R & W
Elec'n 66:939-45 My 22 '15
Power development at the Austin dam. F. S.
Taylor. il diag plan Eng N 73:1124-6 Je 10
'15

Reconstruction of Austin, Tex., masonry dam. F. S. Taylor. il diags Eng N 73:1089-93 Je

Questions about the Austin, Tex., dam. J. D. Justin; F. S. Taylor, Eng N 74:182-3 Jl 22

#### Australia

Sec also Mines and mineral resources-Australia

#### Commerce

American goods for Australian use. J: P. Bray. Metal Work 83:351 Mr 5 '15

#### Commercial policy

a anti-dumping law. Iron Age 96:887 Australia

#### Industries and resources

Australian metal contracts. L. H. Quin. Iron Age 96:1050-1 N 4 '15 Western Australian goldfields: how water sup-plies are provided, L. E. Shapcott. il Sci Am 111:508-9 D 19 '14

## Austria-Hungary

#### Industries and resources

Chemical industries of Austria-Hungary and the war; abstract. E: Donath and G. Ulrich, Met & Chem Eng 13:639-40 S 15 '15 Resicza steel works; a likely war goal, il Iron Age 96:516-18 S 2 '15

#### Navy

Austrian submarines. il Sci Am 113:250 S 18

Submarine for the Austro-Hungarian navy. F: C. Coleman. il Sci Am 112:85 Ja 23 '15

Authorship

Writing technical articles. H Gas Light J 102:1-2 Ja 4 '15 H. T. Owens, Am

See also Journalism

Auto-buses. See Jitney buses; Motor buses Autoclave test. See Cement testing

Automatic machinery. See Machinery, Automatic

Automobile accidents
Investigating and handling automobile accidents. J: S. Mills. Elec Ry J 45:1203-4 Je 26

Prevention of motor-vehicle accidents, S: B. Hare. Elec Ry J 46:812-13 O 16 '15

Automobile brakes. See Brakes, Automobile

Automobile costumes

Fashion hints for winter wear for women. il Automobile 31:1014-16 D 3 '14

Automobile driving
Left-hand vs. right-hand drive. C. C. Blackmore. Sci Am 112:83 Ja 23 '15
Left hand vs. right hand drive. O. B. Potter,
Sci Am 112:309 Ap 3 '15

Automobile engineering

Automobile engineering curricula at the University of Michigan. W. T. Fishleigh, Horseless Age 35:111-14 Ja 20 '15

Automobile engines

Automobile engines

Able engine—sheet steel for motor parts, il diag Automobile 32:594-5 Ap 1 '15

Adjustable V-motor connecting rod big ends, il diags Horseless Age 36:49 Jl 14 '15

Aluminum pistons for racing and high-speed work—connecting-rod stresses complex—four valves per cylinder, C: Vivier, Automobile 33:706-7 O 14 '15

American-built motors of recent design compare favorably with European products, C. S. Ricker, il Automobile 33:106-7 Jl 15 '15

America's engineering triumph at the Sheepshead Bay speedway, A. L. Clayden, il Automobile 33:698-8 O 14 '15

America's smallest Knight—the new Moline, il Automobile 32:225 F 4 '15

Art in high-speed motor design, W. B. Stout, Automobile 33:608-9 S 30 '15

Balanced intake in rotary motor, il diags Auto-

Automobile 33:608-9 S 30 '15
Balanced intake in rotary motor, il diags Automobile 31:1156-7 D 24 '14
Barthel six-cylinder motor, diag Horseless Age 35:148 Ja 27 '15
Bellem and Brégéras automobile engine, diag Am Soc M E J 37:287 My '15
Block castings, with table of motor characteristics in the different price classifications for the past 5 years. Automobile 31:1194-8 D 31

Bournonville rotary valve motor, diags Horseless Age 34:916 D 23 '14
Briscoe eight and four in same chassis, il diags Automobile 33:151-5 Jl 22 '15
Buda eight-cylinder engine, il Horseless Age 35:172 F 3 '15
Capacity of eight-cylinder motors in cubic inches calculated for bores between 2½ and 5 inches, with strokes from 2½ to 6½ inches. Automobile 32:265 F 11 '15
Car vibration and engine unbalanced forces.
L. E. French, Horseless Age 36:52-5 Jl 14 '15
Chalmers valve-in-head motor, il diags Automobile

Chalmers valve-in-head motor. il diags Automobile 33:144-7 Jl 22 '15
Chart for determining brake mean effective pressure. Horseless Age 36:370 O 15 '15
Cole introduces eight-cylinder model, il Horseless Age 35:95-6 Ja 20 '15
Compression ratio at high altitudes. Horseless Age 35:816 Je 16 '15
Connecting-rod design for V motors. C. S. Ricker. Automobile 33:234-5+ Ag 5 '15
Continental light six motor announced. il Automobile 32:1130 Je 24 '15
Continuous carbon remover. Automobile 32:

Automobile 32:1130 Je 24 15
Continuous carbon remover. Automobile 32:
162 Ja 21 '15
Cylinder number; separate cylinder heads. il
diags Horseless Age 34:938-40 D 30 '14
Davis eight uses two camshafts. il Automobile
32:183-4 Ja 28 '15
Discussion on eight cylinder motors at S. A.

32:183-4 Ja 28 '15

Discussion on eight cylinder motors at S. A.
E. Indiana meeting. Horseless Age 35:282-4
F 24 '15

Dorris six—original design. il diags Automobile 32:636-8 Ap 8 '15

Duesenberg double oiling system. il Automobile 32:272 F 11 '15

Duesenberg 1915 motor. il Horseless Age 35: 503 Ap 14 '15

Eight-cylinder engine. H: C. Chatain. il diags Automobile 32:87-9 Ja 14 '15

Empire engineer thinks sixes good for all cars up to 2600 lbs. L: Schwitzer. Automobile 33: 652 O 7 '15

Enger twelve with individual valve cams. il diags Automobile 33:603-4 S 30 '15 Engine for Dennis brothers' subsidy motor lorry; plan. Engineer 119:sup Je 18 '15 Engine power at high altitudes. Horseless Age 36:24 Jl 7 '15 European high-efficiency motors. S. Gerster. diags Automobile 32:657-9, 710-11+, 752-5 Ap 15-29 '15

15-29 '15
Factors in valve-in-head design. W. A. Brush. diags Automobile 33:320-2 Ag 19 '15
Fallacy in twelve argument. D: Fergusson. Automobile 33:792 O 28 '15
Ferro eight-cylinder V-type engine. il diags Horseless Age 35:97-8 Ja 20 '15
Four cylinders and their future. A. L. Clayden. Automobile 33:28-9 Jl 1 '15
Friction horse power of motors. S. R. Thomas. Horseless Age 35:217 F 10 '15; Abstract. Ind Eng 15:60 F '15
Fundamental problems of engine design: with

Horseless Age 35:217 F 10 '15; Abstract. Ind Eng 15:60 F '15
Fundamental problems of engine design; with discussion. A. P. Brush. Automobile 32:1106-9, 1145-6 Je 24 '15; Abstract. Am Soc M E J 37:562-3 S '15
Governors for motor vehicles. T. Douglas. diags Automobile 32:942-5 My 27 '15
Harding connecting-rod under tension; two-cycle English design has double truncated pistons. diags Automobile 32:906 My 20 '15
Herrmann eight uses splash oiling. diag Automobile 32:58-9 Ap 29 '15
Herschell-Spillman eight-cylinder motor. Automobile 32:80-1 Ja 14 '15
High speed automobile motor. C: F. Barrett. il Sci Am 112:11+ Ja 2 '15
High-speed engines. D. M. White. Sci Am S 79:411 Je 26 '15
High speed, high efficiency motors. E: G. Ingram. Horseless Age 35:38-40 Ja 6 '15
History of the twelve-cylinder motor. E. W. Walford. il Automobile 32:500-1 Mr 18 '15
Hollier eight cleverly designed. il Automobile 32:88-91 My 20 '15
How many cylinders? A. L. Clayden. diags Automobile 32:882-3 I My 20 '15
How many cylinders? J. G. Vincent. Eng M 49:930 S '15
How many cylinders? J. G. Vincent. Eng M 49:930 S '15
Inertia forces in twelve-cylinder motors. D. Fergusson. Horseless Age 36:367 O 15 '15
Jenks eight-cylinder motor. il Horseless Age 35:173 F 3 '15

Jenks eight-cylinder motor, il Horseless Age 35:173 F 3 '15 Knight racing motor, diag Automobile 32:291 F 11 '15

Knight racing motor, diag Automobile 32:291 F 11 '1.5
Light pistons make smooth motor, E. W. Walford, diags Automobile 32:362-3 F 25 '15
Locomobile refines both sixes, il diags Automobile 32:1072-5+ Je 17 '15
Lower weight—higher efficiency, A. L. Clayden, Automobile 33:553 S 23 '15
Lozier introduces the H-A-L twelve, il Horseless Age 35:873 Je 30 '15
Marmon features continued for 1916, il diags Automobile 33:12-15 Jl 1 '15
Mathematics of motor flywheel explained, Automobile 33:46-7 S 9 '15
Mean effective pressure and piston speed, charts Horseless Age 36:229-31 S 1 '15
Medanich motor has balanced exhaust, diags Automobile 33:208 Jl 29 '15
Metropolitan S. A. E. discusses aeroplanes and governors, diags Automobile 33:560-3 S 22 '15
Monarch adds eight-cylinder model; Her-

Monarch adds eight-cylinder model; Herschell-Spillman motor interchangeable with Continental six in same chassis. il diag Automobile 32:492-3 Mr 18 '15 Motor speeds at 10 m. p. h. Automobile 31:1115-16 D 17 '14 Multiplex-cylinder motors. Sci Am 113:205 S

National highway twelve. il diag Automobile  $33:326-7~\mathrm{Ag}~19~'15$ 

New motors from an efficiency viewpoint: a comparison of L head, T head and I head motors with respect to power output, weight and fuel consumption. V. I. Moncrieff. Horseless Age 35:182-4 F 3 '15

New York and Detroit engineers discuss eight-cylinder engines. Horseless Age 34:824-7 L 2'14

Automobile engines-Continued

Newcombe's law applied to motors. W: B. Stout, diags Automobile 31:1158-61 D 24 '14 Overhead valves make Ferro eight accessible. il Automobile 32:932-6 My 27 '15 Packard brings out twin six chassis. il diags Automobile 32:932-6 My 27 '15 Packard with 12 cylinders. il diags Horseless Age 35:702-4 My 26 '15 Piston displacement of twelve-cylinder engines in cubic inches; table. Automobile 33:832 N 4 '15

in cubic inches; table. Automobile 33:832 N 4 '15
Piston ring problems. A. J. Mummert. Automobile 32:624-5 Ap 8 '15
Pittsburgh model engine co.'s new model engines. il diag Horseless Age 35:171 F 3 '15
Pressure and piston speed. F. Jehle. Horseless Age 36:317 O 1 '15
Problems of eight-cylinder engine design. O: M. Burkhardt. diags Horseless Age 36: 139-42, 178-81, 235-6, 276-8 Ag 1-S 15 '15
Problems of the eight discussed. Automobile 32:404-5 Mr 4 '15
Progress in motor design. A. L. Clayden. il diags Automobile 33:821-31 N 4 '15
Pros and cons of speed governors. Horseless Age 35:705 My 26 '15
Race motors behave marvelously. A. L. Clayden. Automobile 33:7, 46 J1 1 '15
Reasons for twelve-cylinder motor. J. G. Vincent. Automobile 33:528-30, 545-7 S 16-23 '15; Discussion. 33:547-50, 600-2+ S 23-30 '15
Regal—an eight-cylinder and two others. il diag Horseless Age 35:734-4 Je 2 '15
Road dust in cylinders and bearings—effects and remedy. Automobile 33:18+ J1 '15
Schebler has veteran twelve-cylinder. il Automobile 32:532-3 Mr 25 '15
Six, eight and twelve cylinder automobile motors. J. G. Vincent. Horseless Age 35:735 Je 2 '15
Stating the case for the eight. C: S. Crawford. diags Automobile 33:838-43 N 4 '15; Scheford.

tors. J. G. Vincent. Horseless Age 35:735 Je 2 '15
Stating the case for the eight. C: S. Crawford. diags Automobile 33:838-43 N 4 '15; Discussion. 33:861-2, 877 N 4-11 '15
Stewart piston valve motor provides compressed air. diags Automobile 33:331 N 4 '15; Stutz racing motor has light parts. il diags Automobile 33:698-700 O 14 '15
Turning moments of multi-cylinder engines; comparison of twelve, eight, six and four cylinder engines. L. E. French. Horseless Age 36:323-5 O 1 '15
"Twelve' from the standpoint of vibration. P. M. Heldt. diags Horseless Age 36:271-3 S 15 '15
Twin six balance superior. J. G. Vincent. Automobile 33:792-3 O 28 '15
Two new eight-cylinder motors: a Buda with staggered cylinders and a Northway made for the new Cole eight. il Automobile 32:106-7 Ja 21 '15
Universal motors for light cars. diags Autowo flew eight-cylinder motors. a buda with staggered cylinders and a Northway made for the new Cole eight. il Automobile 32:106-7 Ja 21 '15

Universal motors for light cars. diags Automobile 33:63-4 Jl 8 '15

Vaccarezza two-cycle engine. diags Horseless Age 35:173-4 F 3 '15

Valve-in-head motor supreme. A. L. Clayden. il diags Automobile 32:926-9+ My 27 '15

Watson V-rod provides adjustment. diags Automobile 33:13 Jl 15 '15

Weidely four with aluminum pistons. il diag Automobile 33:192 Jl 29 '15

Weidely—improvements and refinements. il Horseless Age 36:250 S 1 '15

Weidely twelve cylinder motor. il Horseless Age 36:250 S 1 '15

Weidely twelve with overhead camshafts. il Automobile 33:322 Ag 19 '15

Willys starts new Knight régime. il diags Automobile 33:395-100 Jl 15 '15

Wisconsin motors. il diag Horseless Age 36:

Wisconsin motors. il diag Horseless Age 36: 250 S 1 '15

250 S 1 15 Wisconsin motors for 1915, il Horseless Age 35:99-100 Ja 20 '15 Wisconsin motors—four-cylinder, il diag Au-tomobile 32:550-1 Mr 25 '15 Wollaston valve-in-head motor, il Automobile 33:187 Jl 29 '15

See also Automobiles; Carbureters; Cy linders; Fitting (machinery); Gas and o engines

#### Balancing

Engine balance and vibration. A. L. Clayden diags Automobile 32:261-4, 310-13 F 11-18

Straw test for engine balance. Horseless Age 35:277 F 24 '15

Bearings

Automobile engine bearings. W. Betterton. Horseless Age 35:517-18+, 549-51 Ap 14-21

#### Cleaning

Alcohol removes carbon deposit. Automobile 33:332-3 Ag 19 '15 Cleaning automobile motors with denatured alcohol. Sci Am 112:268-9 Mr 20 '15 Motor does not carbonize quickly. Automobile 33:198-9 Jl 29 '15

#### Cooling

Thermo-syphon cooling system. C: S. S. diags Horseless Age 35:512-16 Ap 14 '15 Sage.

Analysis and testing of explosion engine fuels; abstract. K. Dieterich. Am Soc M E J 37:476-7 Ag '15
Analysis and valuation of motor fuels—14 methods for examining them; from German data. Automobile 33:202-5, 247-9+ Jl 29-Ag

Benzol for gasoline as motor fuel. Sci Am 113:  $354~{\rm O}~23~'15$ 

354 O 23 °15
Car and carbureter design suitable for driving with any fuel. diags Automobile 33:288-91+ Ag 12 '15
Driving tests with benzol and benzol-alcohol mixtures by Baron Von Loew. Automobile 33:709-11 O 14 '15
Gasoline engine run on natural gas. L. H. Morrison. Power 41:821 Je 15 '15
Motor fuels; situation in England, and on the continent. V. B. Lewes. Am Gas Light J 103: 165-7, 170-1, 178-81 S 13-20 '15
New alcohol fuel. Engineer 119:584 Je 11 '15 New alcohol fuel. Engineer 119:584 Je 11 '15

See also Benzol; Gasoline; Motor spirit;

#### Horsepower

Horsepower and torque curves of Moon 6-40. Automobile 33:244 Ag 5 '15 Horsepower of two cylinder 5 by 6½. Automobile 33:200-1 Jl 29 '15

#### Ignition devices

Ignition devices

Atwater Kent Ford ignition, il Horseless Age 34:912 D 23 '14

Atwater Kent igniter is interchangeable with magneto. il Automobile 32:553 Mr 25 '15

Atwater Kent mfg. works, Philadelphia: views. Horseless Age 36:184-5 Ag 15 '15

Battery systems improved in detail. diags Automobile 32:284-9 F 11 '15

Bosch duplex ignition system explained, plans Automobile 33:937 N 18 '15

Cables, terminals, switches and wiring methods. P. M. Heldt, il diags Horseless Age 35:412-15 Mr 24 '15

Coil and battery ignition for multi-cylinder motors. P. M. Heldt, il diags Horseless Age 34:978-81 D 30 '14

Combined battery and magneto systems. P. M. Heldt, diags Horseless Age 35:312-15 Mr 3 '15

Connecticut battery ignition for Fords. il Automobile 33:109 Jl 15 '15
Connecticut telephone and electric company automatic ignition system, diags Automobile 33:663 O 7 '15
Construction of a vibrating rectifier for charging automobile ignition batteries. C: Fraasa, diags Sci Am S 80:108-9 Ag 14 '15
Current circuits in Bosch coil, diags Automobile 32:371-2 F 25 '15
Defense of battery-coil ignition. H. E. Rice, Automobile 31:1102-3 D 17 '14
High frequency ignition. P. M. Heldt, diags Horseless Age 35:380-2 Mr 17 '15
High-tension ignition. P. M. Heldt, diags Horseless Age 34:888-91 D 16 '14
Ignition sources. Horseless Age 34:940-2 D 30

Ignition sources. Horseless Age 34:940-2 D 30

Ignition testing apparatus and tests, P. M. Heldt, il diags Horseless Age 35:476-8 Ap

ow tension ignition. P. M. Heldt. diags Horseless Age 34:856-7 D 9 '14

Automobile engines—Ignition devices—Cont.

Magneto and coil ignition. P. M. Heldt. diags
Horseless Age 35:178-81 F 3 15
Magneto spark vs. battery-coil spark. D. H.
Cunningham. Automobile 31:1020-3 D 3 '14
Magneto vs. battery coil—from automobile
drivers' viewpoint. C: S. Manierre. Automobile 32:20-1 Ja 7 '15
New principle in motor car ignition. il diags
Horseless Age 36:186-7 Ag 15 '15
Reasons for advancing spark lever. Automobile
31:1162 D 24 '14
Single spark and similar interrupters. P. M.
Heldt. diags Horseless Age 35:150-2 Ja 27
'15
Spark advance should be function of flame

Spark advance should be function of flame propagation. F. R. Hoyt. Automobile 32: 408-9 Mr 4 '15
Spark plus. P. M. Heldt. diags Horseless Age 34:918-20 D 23 '14
Spark timing methods. P. M. Heldt. il diags Horseless Age 35:274-7 F 24 '15
Systems of electric ignition defined. Automobile 32:589 Ap 1 '15
Two-point ignition. P. M. Heldt. diags Horseless Age 35:311-6 Mr 10 '15
Wiring of Bosch duplex system. diag Horseless Age 34:969 D 30 '14

See also Automobiles—Electric conjument.

See also Automobiles-Electric equipment; Magnetos

#### Lubrication

Automobile lubrication. C. W. Stratford. il Sci Am S 79:392-3, 412-14 Je 19-26 '15; Same. Horseless Age 35:879-81; 36:16-19 Je 30-Jl 7

Exhaust heat cuts oil film, G. S. Bryan, Automobile 32:546-9 Mr 25 '15
Low-test, easily-vaporized oil; objections. C: E. Duryea, Automobile 32:756 Ap 29 '15
Lubricating system for F. N. motors made in Belgium, diag Automobile 32:159-60 Ja 21

Lubrication of old model Pope-Hartford, diag Automobile 32:1126-7 Je 24 '15 Properties of lubricating oils, O. J. May. Horseless Age 35:338 Mr 10 '15 Splash oiling for eights, diags Automobile 32:468-9 Mr 11 '15 Splash oiling for step piston motor, diag Au-tomobile 32:947 My 27 '15

#### Manufacture

Adoption of aluminum pistons. W. M. Levett. Automobile 33:421+ S 2 '15
Advantages of sand-cast pistons. W. M. Levett. Automobile 33:878-9 N 11 '15
Aluminum alloy piston. J. E. Diamond. il diag Automobile 33:551-2 S 23 '15
Aluminum alloy pistons. E. Gruenwald. Horseless Age 35:806+ Je 16 '15

Aluminum construction advantages. Stout. Automobile 33:463 S 9 '15

Aluminum or iron crank cases; a comparison of the two materials on the bases of weight, strength and cost. V. I. Moncrieff. Horseless Age 35:582-3 Ap 28 '15

Aluminum piston critics answered, J. Leo-rold and J. E. Diamond, Automobile 33:744-5 O 21 '15

Aluminum piston will never prove success in truly high-duty motor. F. R. Porter. Auto-mobile 33:420-1 S 2 '15

Aluminum pistons. Horseless Age 36:326 O 1

Aluminum pistons pass unchallenged. Automobile 32:1116-17 Je 24 '15

Aluminum versus steel in motor construction. J. E. Diamond. Automobile 33:508-9 S 16 '15

American alloys best, J. Leopold. Automobile 33:969 N 25 '15

Analyzing heat flow; use of aluminum for automobile motor construction. E. H. Sherbondy. Automobile 33:834-5 N 4 '15

Early days of aluminum pistons. J. Leopold. Automobile 33:650-1 O 7 '15

Foundry 43:291-4 Ag '15

Molding the new Cadillac eight-cylinder motor, H. C. Estep, il Foundry 43:171-4 My '15

Overcoming the slap of aluminum pistons. P. M. Heldt. Horseless Age 36:227-8 S 1, '15 Piston practice; present day design with special reference to aluminum alloy. J. E. Diamond. il diags Automobile 33:871-7 N 11 '15; Discussion. 33:921-4 N 18 '15 Possible troubles with aluminum motor. A. L. Clayden and others. il Automobile 33:275-7 Ag 12 '15

Prefers iron or steel to aluminum. E. H. Sherbondy. Automobile 33:651-2 O 7 '15

#### Overheating

Causes of overheating briefly outlined. Automobile 32:324-5 F 18 '15

## Repair

Rack holds any motor in 32 positions. il Automobile 32:420 Mr 4 '15 V-type eights in the repair shop. Horseless Age 35:91-2 Ja 20 '15

## Terminology

Definite new unit for motor speeds to avoid vague high and low. Automobile 32:1082 Je 17 '15

#### Testing

Ferro eight makes 300-hr. test. il Automobile 33:566-7 S 23 '15

Friction horse power of motors; tests to determine their variation with change in water jacket temperature. Horseless Age 35:217 F 10 '15

Use of optical indicators for checking defects in functioning of motors, diags Automobile 33:976-9, 1018-19 N 25-D 2 '15

#### Valves

Appel is novel valve-driving mechanism, il diags Automobile 33:162-3 Jl 22 '15 Calculating motion of sleeve valves. Horse-less Age 36:269-70 S 15 '15

Negative lap gains in valve timing. Automobile 31:1267-8 D 31 '14

New positive and silent valve operating mechanism. il diags Horseless Age 36:112-13 Jl 28 '15

28 '15 Overhead valves in theory and practice. A. L. Clayden. Automobile 32:618-19 Ap 8 '15 Rotary valve makes slow progress. diag Au-tomobile 32:595 Ap 1 '15 Rotary valve motors. Automobile 33:285 Ag 12 '15

Rotary valve progress, diags Horseless Age 35:249 F 17 '15

Single, balanced, inlet and exhaust valve.

J. D. Roots. diag Horseless Age 35:375 Mr
17 '15

Timing valves by the flywheel. Automobile 33: 512-13 S 16 '15
Valve timing of American motors; tabulation. Automobile 31:1268-9 D 31 '14
Valve types. diags Horseless Age 34:940 D 30

Walker motor uses cored rotary sleeve. diags Automobile 32:728 Ap 22 '15

Automobile factories
Car, truck and accessory plants expand. il
Automobile 31:1151-3+ D 24 '14
Detroit plants make \$5,000,000 additions. il
Automobile 33:324-5 Ag 19 '15

Directory of automobile makers. Automobile 31:1262-3 D 31 '14

Flint—second city of automobile industry. L V. Spencer. il Automobile 32:569-75 Ap 1 '15

How Dodge brothers plant was reorganized. H. C. Estep. il plan Iron Tr R 56:909-16 My 6 '15

Rehabilitation of existing plants as a factor ir production costs. H. V. Coes. plans Eng M 49:363-8 Je '15

Solving the spares problem: the Maxwell company's Newcastle plant. il Automobile 32:316-20 F 18 '15

Stamping plant for quantity production. F. L. Prentiss. ii Iron Age 95:489-94 Mr 4 '15 \$25,000,000 for new buildings and equipment. ii Horseless Age 36:258-9 S 15 '15

Unique conveyor in automobile plant. il plan Iron Age 96:565-8 S 9 '15

Automobile factories—Continued
War rushes French plants; automobile factories working 24 hours a day on ammunition, aeroplane and military supplies.
W. F. Bradley. il Automobile 32:1013-15+ Je 10 '15

See also Automobiles—Manufacture; also Ford motor company

Automobile fans. See Automobiles-Fans

Automobile headlights. See Automobiles-Light-

Automobile horns
Automobile warning signals. A. L. McMurtry.
diags Eng M 49:602-5 Jl '15
Dies for drawing flanged shells. E. P. Davis.
diags Mach 21:532-4 Mr '15
Johns-Manville co. announce new motor, hand
and vibrator horns. il Horseless Age 34:973
D 30 '14

Automobile industry and trade Are you selling cars or buying them? Horseless Age 34:901-2 D 23 '14

less Age 34:901-2 D 23 '14
Automobile chronology for 1914. Automobile 31:
1154-5 D 24 '14
Certified tests by dealers as sales helps.
Horseless Age 35:597-8 My 5 '15
Educating the dealer's mechanic. A. L. Horn.
Horseless Age 35:641 My 12 '15
Forces at work during 1914—the year review.
Automobile 31:1143-6 D 24 '14
Influence of the war on the automobile industry. H. W. Perry. il Sci Am 113:206-8 S 4 '15

Interesting facts about the automobile business, G. B. Griffin, Elec R & W Elec'n 67: 338 Ag 21 '15

Makers cannot maintain prices through contracts with dealers. Automobile 31:1085 D 10 '14

Metropolitan S. A. E. discusses effects of war, Horseless Age 35:185-6 F 3 '15 What the motor car does for other industries, G. B. Griffin, Horseless Age 36:187 Ag 15 '15 See also Automobile factories: Automobile service stations; Electric vehicle industry; Garages; Motor truck industry; also Ford motor company

#### Accounting

Should dealers' parts accounts be standard-ized? A. H. Remsen. il Horseless Age 36:69 Jl 21 '15

#### Service

That constitutes service to the owner? C: Gould. Horseless Age 36:90-1 Jl 21 '15 See also Automobile service stations

## Australia

American-made chassis lead in Australian trade. Automobile 32:816 My 6 '15 New South Wales' 1914 imports \$2,893,830. Automobile 32:531 Mr 25 '15

#### Belgium

Belgian car factories intact. W. F. Bradley. il map Automobile 32:99-101 Ja 21'15

#### Canada

Business gain in western Canada. A. C. Emmett. Automobile 31:1112-13 D 17 '14

#### Ceylon

British India. U S Sp Cons Rep 72:574-8 '15

#### France

Americans speed up French factories, W. F. Bradley, il Automobile 32:450-1 Mr 11 '15 British duty threatens French exports, il Automobile 33:734-5 O 21 '15 French automobile industry in good condition, il Automobile 32:101-2 Ja 21 '15

#### Germany

Germany's export trade; how the 1912 foreign business of \$30,000,000 was distributed, M. Braun. Automobile 31:1009-13+ D 3'14

#### Great Britain

Analysis of automobile industry in Great Britain during war. Automobile 33:38-9 Jl 1 '15 Great Britain again our largest buyer. Automobile 32:736-7 Ap 22 '15

War stops Olympia, but not car development. J. E: Schipper. diags Automobile 31:1055-7 D 10 '14

British India. U S Sp Cons Rep 72:191-204 '15 U. S. motor cars gain prestige in India. Horseless Age 35:490 Ap 14 '15

#### Tasmania

Automobile trade in Tasmania, Horseless Age 35:184 F 3 '15

#### United States

Car and truck sales in Southwest gain 64.2% in 3 months. Automobile 32:576-8 Ap 1 '15 Colorado 1915 motor car registration by make. H. G. Hedden. Automobile 33:172-3 J1 22 '15 Detailed export statistics show that U. S.

Detailed export statistics show that U. S. dominates automobile world. Automobile 33: 624-5 S 30 '15
Directory of automobile makers. Automobile 31:1262-3 D 31 '14
Distribution of motor car exports for the past fiscal year. Horseless Age 36:244 S 1 '15
Exports for 10 months ending October total \$21,241,860. Automobile 31:1129 D 17 '14
Exports of 1913-14 exceeded forty millions; tabulation. Horseless Age 34:301-3 Ag 26 '14
Exports take another jump. Horseless Age 36:170 Ag 15 '15
Farmers of Southwest could buy 94,000 cars at \$1,000 each. map Automobile 32:406-7 Mr 4 '15

Exports take another jump. Horseless Age 36:170 Ag 15 '15
Farmers of Southwest could buy 94,000 cars at \$1,000 each. map Automobile 32:406-7 Mr 4 '15 50,000 cars for Iowa in 1915. C. G. Sinsabaugh. Automobile 32:490-1 Mr 18 '15
Gaining the summit of American industries. Horseless Age 36:264 S 15 '15
History of the American automobile industry. D: Beecroft. Automobile 33:775-9, 836-7, 880-1, 982-3 O 28-N 18 '15
Kansas City—a. great distributing center. D: Beecroft. Automobile 32:336-7 F 18 '15
Michigan's six months' registrations. M. Braun. Automobile 33:504-5 S 16 '15
Middle west crops presage increased car sales. map Automobile 33:497-9+ S 16 '15
More than 1,800,000 cars registered in U. S. Horseless Age 35:4 Ja 6 '15
Motor vehicle registrations and revenues, 1914. Horseless Age 35:620 My 5 '15
Motor vehicles in the United States. Munic J 38:657 My 13 '15
New England gains 48,063 cars in 2 years. J. T. Sullivan. Automobile 32:395-7 Mr 4 '15
New England will spend \$58,800,000 for cars and accessories. J. E: Schipper. map Automobile 32:439-41 Mr 11 '15
Northwest farmers offer big car market. Automobile 32:270-1 F 11 '15
Omaha—distributor for the grain belt. D: Beecroft. Automobile 32:355-6 F 25 '15
Rhode Island's registration analyzed. Automobile 33:879 N 11 '15
2,070,903 cars in United States. D. M. Lay. map Automobile 33:221-4 Ag 12 '15
261,860 cars have electric systems—other statistics. Automobile 33:322 Ag 19 '15
United States has 1,754,570 cars. D. M. Lay. map Automobile 32:525-7 Mr 25 '15
United States has 1,754,570 cars. D. M. Lay. map Automobile 32:525-7 Mr 25 '15
United States has 1,754,570 cars. D. M. Lay. map Automobile 32:525-7 Mr 25 '15
United States has 1,754,570 cars. D. M. Lay. map Automobile 32:525-7 Mr 25 '15
United States has 1,754,570 cars. D. M. Lay. map Automobile 32:525-7 Mr 25 '15

Automobile lamps, See Automobiles-Lighting

Automobile laws and regulations

utomobile laws and regulations
Car should carry ownership guarantee. L. A.
Ward. Automobile 32:670-1 Ap 15 '15
Motor car laws of all the states; tabulation.
Horseless Age 36:216-17 S 1 '15
Why local regulations of motor truck traffic
are objectionable. Horseless Age 35:407-9
Mr 24 '15
Vellowstone park automobile.

Yellowstone park automobile regulations now in effect. Eng Rec 72:172 Ag 7 '15

Automobile mufflers
Automobile muffler losses experimentally determined. diags Horseless Age 35:612-17 My 5 '15 Exhaust

xhaust silencer operating on principle of neutralizing sounds. diag Elec W 66:990-1 O

Stamping an automobile muffler head. F. L. Prentiss. il Iron Age 96:971-2 O 28 '15

Automobile number plates

New York state to use new style of automobile number plate. il Good Roads n s 10:237

O 30 '15

Automobile parts
Should dealers' parts accounts be standardized? A. H. Remsen, il Horseless Age 36: 69 Jl 21 '15
S. A. E. suggests standard names, Automobile 33:303 Ag 12 '15
Solving the spares problem: the Maxwell company's Newcastle plant, il Automobile 32:316-79 F 18 '15 32:316-20 F 18 15 Standardizing names of parts. Automobile 33: 236-7 Ag 5 '15

236-7 Ag 5

See also Automobiles-Standards

Scc also Automobiles—Standards

Automobile patents

Broad demountable rim patent upheld. il

Horseless Age 36:224+ S 1 '15

Chamber of commerce to defend Kardo patents
suit. Horseless Age 34:829-30 D 9 '14

Court holds Baker front axle patent to be
void. Horseless Age 35:285, 293-4 Mr 3 '15

Decision rendered in carbureter suit. Automobile 32:296 F 11 '15

Delco wins in self-starter patent suit. Horseless Age 35:324-324a Mr 10 '15

N. A. C. C. cross-licensing patent plans now
almost completed. Automobile 33:39+ J1 1
'15

Ohio court dismisses Kardo axle patent suit. Horseless Age 35:525+ Ap 21 '15 Perlman wins decision in long-contested de-

mountable rim patent suit. Automobile 33: 394-5 Ag 26 '15
Two-speed axle decision. Automobile 33:73-80 J1 8 '15

Automobile racing
America's engineering triumph at the Sheepshead Bay speedway. A. L. Clayden. il Automobile 33:69-6-8 O 14 '15
Astor cup won at 102 miles per hour, il Horseless Age 36:351-3+ O 15 '15
Burman's Peugeot wins Oklahoma City race.
Herseless Age 35:50-8 My 5 15
Light Sheep She

Horseless Age 33:363 My 5 15
Burman's Peugeot wins Oklahoma race. C. S. Moore, il Automobile 32:794-5 My 6 '15
Dario Resta's Peugeot wins grand prize. Horseless Age 35:291-2 Mr 3 '15
De Palma, in Mercedes, wins at \$9.84 miles per hour. Automobile 32:969-73 Je 3 '15
De Palma's Mercedes wins both Elgin races. Horseless Age 34:306-7 Ag 26 '14
Fluctuations of the averages made in the season's leading contests. Horseless Age 36:165
Ag 15 '15
Getting ready for the international sweepstakes; cars and drivers who will contest. il Horseless Age 35:669-72 My 19 '15
Holiday racing on the speedways, il Horseless

II Horseless Age 35:669-72 My 19 '15 Holiday racing on the speedways, il Horseless Age 36:1-3 Jl 7 '15 How the Stutz cleaned up at the Elgin races. Horseless Age 36:214-15 S 1 '15 Little tire trouble at Twin Cities. Automobile 33:457 S 9 '15

Lattle tire trouble at Twin Cities. Automobile 33:457 S 9 '15
Low speed marks Providence century. C. P. Shattuck, il Horseless Age 36:312-13 O 1 '15
Maxwell—Mercer—Duesenberg July 4 winners.
Automobile 33:53-9 Jl 8 '15
Mulford wins 300-mile race on Des Moines speedway. il Automobile 33:296-7 Ag 12 '15
1914—a good contest year. Automobile 31: 1147+ D 24 '14
1914 a year of speed records. J. T. Shaw. Horseless Age 34:839-840b D 9 '14
Oldfield's Maxwell non-stop winner at Venice. il Horseless Age 35:392-392b Mr 24 '15
Over 100 miles per hour on Sheepshead speedway. il Horseless Age 36:306-7 O 1 '15
Overhead valves triumph. A. L. Clayden. il Automobile 32:973-7 Je 3 '15
Pullen wins Corona race at 87.7 m. p. h. il Automobile 31:1017-19 D 3 '14
Resta in Peugeot victorious. il Automobile 33: 1-6 Jl 1'15
Resta takes Harkness cup race at 105.39 miles

Resta takes Harkness cup race at 105.39 miles per hour. il Automobile 33:846-7 N 4 '15 Resta wins again. il Automobile 32:446-7 Mr 11 '15

Resta wins Century at 101.86 miles per hour. il Automobile 33:294-5 Ag 12 '15

G. Waddell. il Resta wins grand prize. A. G Automobile 32:398-9 Mr 4 '15

Resta's generalship won Vanderbilt, A. Waddell, il Automobile 32:512-13 Mr 18 '15

Resta's record 101.86 miles per hour. il Horseless Age 36:166-7+ Ag 15 '15

Review of Corona road race. H. G. Hall. il Horseless Age 34:836-8 D 9 '14 Rickenbacher wins Narragansett 100-mile. J. T. Sullivan. il Automobile 33:554-5 S 23

J. 1. Sullivan. It Automobile 33:534-5 S 23
'15
Setting for the 500-mile race at Indianapolis.
A. L. Clayden. diags Automobile 32:879-82
My 20 '15
Speed records of the 500-mile race. Automobile 32:330-1 My 27 '15
Stutz cars triumph at Elgin road races. il diag Automobile 33:461-5 Ag 26 '15
Stutz triumphs at 102.6 miles per hour. J. E:
Schipper. il Automobile 33:4685-95 O 14 '15
Stutz wins first and second places at Twin Cities. Automobile 33:455-6 S 9 '15
Summary of the C. A. C. trophy race. Horseless Age 34:308-9 Ag 26 '14
Thirty-two cars named for Vanderbilt cup race. il Horseless Age 35:224a-224c F 17 '15
350-mile Astor cup auto race. il Sci Am 113:
357+ O 23 '15
Twenty-two cars qualify for 500-mile race.

3501-mile Astor cup auto race, it Sci Am 115: 357+ O 23 '15
Twenty-two cars qualify for 500-mile race. D: Beecroft. Automobile 32:923-5 My 27 '15
Twin City race won by fifth of second. il Horseless Age 36:260-1+ S 15 '15
Vanderbilt cup race also won by Resta's Peugeot. il Horseless Age 35:325-8 Mr 10

Winning of the grand prize. A. G. Waddell. il Automobile 32:448-9 Mr 11 '15 World's records made in 500-mile sweep-stakes. Horseless Age 35:725-9 Je 2 '15 World's records shattered at Chicago. il Horse-less Age 35:865-8 Je 30 '15

Sor also Speedways

Automobile service stations
Can manufacturers have a standard service
policy? A. Macauley. Horseless Age 35:606-8
My 5 '15

Mty 5 L5 Metropolitan section of S. A. E. discusses truck makers' obligations to customers. B. B. Bachman. Automobile 32:772-3 Ap 29

'15
Service heads want standard policy. Automobile 33:83-5 Jl 8 '15
Service managers discuss their problems. J. Smith. Horseless Age 38:9-10 Jl 7 '15
Sub-division, saving and safety. Horseless Age 34:889-70 D 16 '14
Truck makers to decide on standard service policy. L. V. Spencer. Automobile 32:841-4
My 13 '15

Sce also Garages

Automobile signals

Rear signaling devices for automobiles, il Sci Am 113:274-5 S 25 '15

See also Automobile horns

Automobile touring Motor travel in desert country of southern California. L: H. Eddy, il Eng & Min J 100:835-7 N 20 '15

Sixth volume added to Blue books. maps Automobile 32:596-9 Ap 1 '15 Three routes offered to Pacific coast tourists. Automobile 31:1079 D 10 '14

Automobile trailers Industrial plant automobile trailer, il Iron Age 96:133 Jl 15 '15 Automobiles

Abbott-Detroit eight. il Automobile 33:520-1 S 16 '15 Abbott eight—a new model with interesting features. il Horseless Age 36:14-15 J1 7 '15 Allen line two models on one chassis. il Auto-mobile 33:882-3 N 11 '15

Argo chassis larger for 1916, il Automobile 33:110-12 Jl 15 '15
Auburn models for 1916 -a six and four, il Horseless Age 35:812 Je 16 '15
Auburns, 1916—a six and a four, il Automobile 33:156-7 Jl 22 '15

Autos and the electric car. J: A. Beeler. Elec Ry J 46:590-2 S 18 '15

Briscoe eight and four in same chassis, il diags Automobile 33:151-5 Jl 22 '15

Briscoe line, 1916, which will be made up of an eight and a four. il Horseless Age 36:12-13 Jl 7'15

Buicks for 1916 to be sixes exclusively, il Horseless Age 35:770-1 Je 9 '15

Automobiles-Continued

Buicks, 1916, are both sixes, il Automobile 32:1068-71 Je 17 '15
Cadillac eight in second year, il diags Automobile 33:188-91 Jl 29 '15
Cadillac eight with detail refinements known as type 53, il Horseless Age 36:134-5 Ag 1

'15
Cameron six touring or roadster, il Automobile 33:329 Ag 19 '15
Car of 1915. S. P. McMinn. il Sci Am 112:10+
Ja 2 '15
Car that stays young. Automobile 33:429-31,
517-19, 612-15 S. 2, 16, 30 '15
Chalmers brings out light six. il diags Automobile 33:925-7 N 18 '15
Chalmers cars in three models for 1916, including a new six-40, il Horseless Age 36:50-1
JI 14 '15

Comparison of features of the average American car for 5 years. Automobile 31:1193 D 31 '14

ican car for 5 years. Automobile 31:1193 D 31 '14
Cornelian—a unique light car. il Horseless Age 35:814 Je 16 '15
Cornelian—body acts as frame in new model. il diag Automobile 32:726-7 Ap 22 '15
Crow-Elkhart model for 1916. il Horseless Age 36:171 Ag 15 '15
Daniels eight of strong construction. il Automobile 33:756 O 21 '15
Davis line is four, two sixes and twelve. il Automobile 33:478 S 9 '15
Dorris six—original design. il diags Automobile 32:636-8 Ap 8 '15
Dort continues roadster and touring. il diag Automobile 33:193-5 Jl 29 '15
Driggs-Seabury light cars. il diags Horseless Age 35:169-70 F 3 '15
Eleven new chassis seen at show. il Automobile 32:12-17+ Ja 7 '15
Empire line—two models. il Horseless Age 36: 380-1 O 15 '15
Empire—new model 33. il Horseless Age 35: 570-1 Ap 28 '15
Empire—new model 33. il Horseless Age 35: 570-1 ap 28 '15
Empire 1916—larger high-speed motor. il diags Automobile 32:680-3 Ap 15 '15
Empire six in production. il Automobile 33: 748-9 O 21 '15
Enger twelve with individual valve cams. il diags Automobile 33:603-4 S 30 '15

748-9 O 21 '15
Enger twelve with individual valve cams. il diags Automobile 33:603-4 S 30 '15
Engineering development—1915; alphabetical list of cars and description of new designs. diags Automobile 31:1228-60 D 31 '14
Farmack four—overhead valves. diags Automobile 33:892 N 11 '15
Fiat bodies of distinctive design. il diags Automobile 33:60-2 Jl 8 '15
Forty cars at Importers' salon. il Automobile 32:18-19+ Ja 7 '15
Glide six—one model only. il Horseless Age

Glide six—one model only. il Horseless Age 36:266-7 S 15 '15 Glide six replaces four for 1916. il Automobile 33:464-5 S 9 '15

Grant popular-priced six. il Horseless Age 34: 971-2 D 30 '14 Grant six—larger motor in 1916. il Automobile 33:605-7 S 30 '15

Grant Six—larger motor in 1916, if Automobile 33:605-7 s 30 '15

Great Western six with many unusual features, if Horseless Age 36:74-5 Jl 21 '15

Halladay light six, if Horseless Age 35:470-1

Ap 7 '15
Haynes light six models, il Horseless Age 35:
747 Je 2 '15

747 Je 2 '15 Herff-Brooks adds a small four chassis. il Automobile 32:508-9 Mr 18 '15 Hollier eight. il Horseless Age 35:501-2 Ap 14

Hollier eight cleverly designed, il Automobile 32:857-9 My 13 '15 Hudson, 1916, has yacht line body and is offered at lower figure, il Horseless Age 35: 768-9 Je 9 '15 per both below il I.

768-9 Je 9 '15
Hudson, 1916—new boat body, il diag Automobile 32:1023-5+ Je 10 '15
Hupmobile has larger engine—lower price. il
Horseless Age 35:738-9 Je 2 '15
Hupmobile—larger motor in 1916, il diags Automobile 32:982-5+ Je 3 '15
Hupmobile model K has larger engine, il
Horseless Age 34:322 Ag 26 '14

Imperial for 1916—a low priced four, il Horseless Age 35:808-9 Je 16 '15

Imperial four has large motor, il diag Automobile 32:1076-7 Je 17 '15

Jackson eights and a four, il diags Automobile 33:794-5 O 28 '15

Jeffery four with high speed, long stroke motor, il Horseless Age 36:110-11 Jl 28 '15

Jeffery—new four, il diags Automobile 33:183-7

Jl 29 '15

Kearns cars—quick detachable bodies, il diag Automobile 32:770-1 Ap 29 '15 King eight-cylinder for \$1,350. il Automobile -31:1060-2 D 10 '14

-31:1060-2 D 10 '14 King eight-cylinder to sell for \$1,350. il Horse-less Age 34:850-1 D 9 '14 Kissel adds four-cylinder chassis. il diags Automobile 33:469-71 S 9 '15 Kissel adds L-head block six. il Automobile 31: 1124-5 D 17 '14 Kissel kar 42-six. il Horseless Age 34:881-2 D

Rissel Kar—new ideas—all-year models. il Horseless Age 36:168-70 Ag 15 '15 Kline adopts unit power plant. il Automobile 31:1032-3 D 3 '14 Krit 1915 shows little change. il Horseless Age 34:323-4 Ag 26 '14 Lewis, 1916. VI equipped with vulcan electric gear shift. il Horseless Age 35:840-1 Je 23 '15 Light cars at the show. H. H. Brown. Horseless Age 35:23-4 Ja 6 '15 Lightning and the automobile. C. L. Johnson. Sci Am 111:507 D 19 '14 Lippard-Stewart—two Brockways. il Automobile 32:640-1 Ap 8 '15 Locomobile refines both sixes. il diags Automobile 32:1072-5+ Je 17 '15 Locomobile sixes for 1916. il diag Horseless Age 35:778-9 Je 9 '15 McFarlan cars larger for 1916. il Automobile

Age 35:778-9 Je 9 '15 McFarlan cars larger for 1916, il Automobile 33:376-7 Ag 26 '15 McFarlan line improvements, il Horseless Age 36:172-3 Ag 15 '15 McFarlan six—improvements, il Horseless Age 34:319-20 Ag 26 '14 Madison light six roadster and touring car, il Horseless Age 35:780 Je 9 '15 Marion light six, il Horseless Age 35:706-7 My 26 '15

26 '15
Marion light six announced, il Horseless Age
35:652 My 12 '15
Marion six—high-speed motor in 1916, il Automobile 32:860-2 My 13 '15
Marmon features continued for 1916, il diags
Automobile 33:12-15 Jl 1 '15
Marmon 41 with body refinements and detail
improvements, il Horseless Age 35:842-3 Je
22 '15

,15 Maxwell for 1916 with improvements and lower

Maxwell for 1916 with improvements and lower price. il Horseless Age 36:136-7 Ag 1 '15 Maxwell, 1916, larger—price lower, il diag Automobile 33:148-50 J1 22 '15 Maxwells racers—some technical details. il Horseless Age 35:519-20 Ap 14 '15 Maxwells designed for 105 miles per hour. il Automobile 32:528-30 Mr 25 '15 Mecca 30 a low-priced light car. il Horseless Age 36:105+ J1 28 '15 Mercer shows new models. il Horseless Age 35: 32-3 Ja 6 '15 Miscellaneous mechanical details of show cars. A. C. Woodbury, il diags Horseless Age 35: 17-21 Ja 6 '15

Also an anisation of the Alba anisation of t

Moline-Knight featured by simplicity. il diags Automobile 33:336-9 Ag 19 '15 Moline-Knight 40. il Horseless Age 35:601-3 My 5 15

Monarch adds eight-cylinder model; Herschell-

Monarch adds eight-cylinder model; Herschell-Spillman motor interchangeable with Continental six in same chassis. il diags Automobile 32:492-3 Mr 18 '15 Moon cars have Continental motors. il diag Horseless Age 34:325 Ag 26 '14 Moon 1916 line comprises a 6-30 and a 6-40. il Horseless Age 35:874-5 Je 30 '15 Motor cars—1914. Engineer 119:8-9 Ja 1 '15 National adds a twelve and a six. il Automobile 32:940-1 My 27 '15 National highway twelve. il diag Automobile 33:326-7 Ag 19 '15

Automobiles-Continued

National highway twelve. il Horseless Age 36: 222-3 S 1 15

New car exhibits at Chicago. il Horseless Age 35:85-6 Ja 20 '15

New car models seen at the Palace show. il diags Automobile 32:1-4 Ja 7 '15

Niagara four—European touches' il Automobile 33:118-19 S 2 '15

Nine new cars on display at Chicago. il Automobile 32:178-81 Ja 28 '15

1915—a 7-league stride: eight-cylinder motors—sixes for less than \$800—vacuum feed—spiral bevel gears. Automobile 31:1187-93+ D 31 '14

Oakland adds eight-cylinder model. il Automobile 33:789-91 O 28 '15

Oakland four, 1916, il Automobile 32:948-50 My 27 '15

27 '15 Oakland model 38 for 1916, il Horseless Age 35:676-7 My 19 '15 Oakland six—new low-priced, il diags Automobile 32:1026-9 Je 10 '15 Oldsmobile eight, model 44 with helical final drive, il Horseless Age 36:362-3+ O 15 '15 Oldsmobile eight replaces six—new four. il diag Automobile 32:937-9+ My 27 '15 Oldsmobile light eight, il Automobile 33:746-7 O 21 '15

Oldsmobile—the model 43 for 1916, il Horseless Age 35:813 Je 16 '15

Age 35:813 Je 16 '15 Overland brings out new six. il Automobile 33:278-9 Ag 12 '15 Overland 83 to sell at lower figure. il Horse-less Age 35:736-7 Je 2 '15 Overland four. il diags Automobile 33:928-31 N 18 '15

N 18 '15
Overland four—price lower, il diag Automobile 32:978-81+ Je 3 '15
Overland model 86, a six-cylinder car of 45
h. p. il Horseless Age 36:182-3 Ag 15 '15
Owen magnetic car, il diag Horseless Age 34:913-14 D 23 '14
Owen magnetic; five cars make 800-mile run through mountain sections, il Automobile 33:616-17 S 30 '15
Packard brings out twin six chassis, il diags

33:616-17 S 30 '15
Packard brings out twin six chassis. il diags
Automobile 32:932-6 My 27 '15
Packard with 12 cylinders. il diags Horseless
Age 35:702-4 My 26 '15
Paige company enters the field of sixes. il
Horseless Age 34:907-8 D 23 '14
Paige has new block six at \$1,395. il Automobile 31:1038-9 D 3 '14
Paige model, the 6-36 announced for 1916. il
Horseless Age 35:766-7 Je 9 '15
Pathfinder twelve and six for 1916. il diag
Automobile 32:1064-6+ Je 17 '15
Peerless 48-six. il Horseless Age 34:321 Ag 26 '14

Peerless four, \$2,000—six at \$2,250. il Automobile 31:1034-7 D 3 '14
Pilgrim, a new light car from Detroit, il Horseless Age 34:915 D 23 '14
Pilot introduces an eight and a popular priced six il Horseless Age 36:314-15 O 1 '15
Porter-Knight speed creations, il diags Automobile 32:789-93 My 6 '15
Premier sextette with Timken axles and worm bevel drive, il Horseless Age 35:34-5 Ja 6 '15
Premier—some features of the new models, il Horseless Age 35:569 Ap 28 '15
Pros and cons of automobile construction features, il diags Horseless Age 34:938-54 D 30 '14
Pullman junior, il Horseless Age 34:909 D 23

Pullman junior. il Horseless Age 34:909 D 23 '14 Regal eight cylinder model and

Regal eight cylinder model and two Regal fours. il Horseless Age 36:106-7 Jl 28 '15
Regal 1916 line is an eight and two fours. il Automobile 33:196-7 Jl 29 '15
Remington cars. il plan Horseless Age 35: 146-7 Ja 27 '15
Reo design—many unique points. il diags Automobile 33:458-62 S 9 '15
Reo five-passenger six for \$1,385. il Automobile 31:1063-5 D 10 '14
Reo six-cylinder. il diag Horseless Age 34:877-9 D 16 '14
Review of the year 1914: automobiles. Sci Am 112:7 Ja 2 '15
Riviera models and a light 30 Fiat for 1916. il Horseless Age 35:848-9 Je 23 '15
Saxon adds roadster on six chassis, il diags Automobile 32:552 a 20 acceptance.

Saxon adds roadster on six chassis, il diags Automobile 33:556-9 S 23 '15

Saxon four and six models—refinements. il Horseless Age 36:310-11 O 1 '15 Saxon six to sell for \$785. il Automobile 31: 1037 D 3 '14 S. A. E. committee reports and papers. Auto-mobile 32:1057-61, 1088-90, 1103-5 Je 17-24 '15 S. A. E. papers and the discussions at the professional sessions. Horseless Age 35:827-30 Je 23 '15

professional sessions. Horseless Age 35:827-30 Je 23 '15
Sphinx car. il Horseless Age 34:852 D 9 '14
Standard six and eight. il Horseless Age 35:
468-9 Ap 7 '15
Standard steel cars. il diags Automobile 32:
723-5 Ap 22 '15
Stearns small four. il Automobile 33:328-9 Ag

19 '15 Stewart motor corporation produces pleasure car. il Horseless Age 35:305-6 Mr 3 '15 Stewart six—a new chassis. il Automobile 32:380-1 F 25 '15 Studebaker in eleven types on two chassismodels. il Horseless Age 35:876-8 Je 30 '15 Studebaker refines four and six. il diag Automobile 33:30-2 Jl 1 '15 Westcott concentrates on two sixes. il Automobile 33:239-3 PA 5 '15 Westcotts—six and four chassis of clean design take four body types, il diags Automobile 32:634-5 Ap 8 '15 Willys-Knight price reduced. il Horseless Age 34:911 D 23 '14 Willys-Knight refinements. il Automobile 31:

Willys-Knight price reduced, it Horseless Age 34:911 D 23 '14
Willys-Knight refinements, il Automobile 31: 1126-7 D 17 '14
Willys-Knight which is to sell at a moderate figure, il Horseless Age 36:44-5 Jl 14 '15 lags. Horseless Age 35:58-74, 110-13 Ja 13-20 '15
Winton brings out smaller six, il Automobile 31:1172-3 D 24 '14

See also Automobile engines and other headings beginning Automobile; Cyclecars; Electric trucks; Electric vehicles; Fire apparatus, Motor; Garages; Jitney buses; Motor buses; Motor cycles; Motor trucks; Steam buses; Tires (automobile)

# Accidents

See Automobile accidents

## Axles

Axle design for accessibility and strength, diags Automobile 33:472-5 S 9 '15

Must axles be turned askew to cushion one-wheel shocks horizontally. Automobile 32:

New type of

wheel shocks horizontally. Automobile 32: 593+ Ap 1 '15
New type of American axle. diag Horseless Age 35:206 F 10 '15
Pivoted front axle design. A. C. Woodbury. diags Horseless Age 35:419-20 Mr 24 '15
Relative merits of semi, three-quarter and full-floating axles. A. M. Laycock. diags Horseless Age 34:328-31 Ag 26 '14
Sheldon worm gear axle. il diags Automobile 32:946-7 My 27 '15
Types of rear axles. il diags Horseless Age 34:3949-50 D 30 '14

34:949-50 D 30 '14

See also Automobile patents

# Bearings

Bearings
Ball bearings in theory and practice, B. D.
Gray, diags Automobile 32:846-9, 896-9+ My
13-20 '15; Same. Horseless Age 35:673-5,
713-14 My 19-26 '15
Court holds Baker front axle patent to be
void. Horseless Age 35:285, 293-4 Mr 3 '15
Directions for adjusting main and connectingrod bearings. Automobile 31:1114 D 17 '14
Installing the center ball bearing, diags Automobile 32:192 Ja 28 '15

Maximum loads on automobile road wheel bearings. H. G. Baldwin. diags Horseless Age 36:319-21, 371-3 O 1-15 '15

Most accurate automobile part; methods of ball bearing manufacture call for micro-scopic inspection of material and product. A. L. Clayden, il Automobile 32:701-5 Ap 22 '15

## Bodies

Adapting the touring body for winter use. il Horseless Age 36:359-61 O 15 '15

American automobile coachwork: criticism of domestic and foreign car bodies. J: J. Ide. il Sci Am 112:21+ Ja 2 '15

Automobiles-Bodies-Continued

Automobile bodies. H. J. Hayes. Horseless Age 35:59-60 Ja 13 '15

Age 35:59-60 Ja 13-15 Body improvements revealed by the show. C. S. Ricker, diags Horseless Age 35:12-16 Ja 6'15 Car bodies of 1915, il Automobile 31:1199-1214 D 31'11 Closed body styles, il Automobile 32:112-22 Ja

Closed body styles. If Automobile 32:112-22 Ja 21 '15 Coupé bodies for runabout use. G: J. Mercer. diag Automobile 31:1108-9 D 17 '14
Development in art of body design for inclosed cars. il Automobile 32:123-6 Ja 21 '15
Ideal touring car body. J: J. Ide. il diag Automobile 32:25 Ja 7 '15
King cars—closed bodies. il Horseless Age 36: 173 Ag 15 '15
Luxurious streamline body not yet built. J. F. Brasor. diag Automobile 33:653 O 7 '15
Making aluminum automobile bodies. il Iron Age 95:1213-16 Je 3 '15
Marked improvement in body design. G: J. Mercer. il diags Automobile 32:219-25 F 4 '15
Quantity production favors metal body. H. J. Hayes, Automobile 32:37 Ja 7 '15
Stutz features new bodies. il Automobile 33: 240-1 Ag 5 '15
Three-quarter cabriolet coupé. G: J. Mercer.

Stutz features new bodies. If Automobile 35, 240-1 Ag 5 '15
Three-quarter cabriolet coupé. G: J. Mercer. plans Automobile 32:494-5 Mr 18 '15
Torpedo motorcar. il Sci Am 112:346 Ap 10 '15
Trends in touring body designs. G: J. Mercer. diags Automobile 33:67-9 Jl 8 '15

See also Automobiles-Tops; Automobiles -Upholstery

Brakes

See Brakes, Automobile

#### Chassis

Aluminum in automobile chassis. A. L. Clayden; J. E. Diamond. Automobile 33:330-1 Ag 19 '15

19 '15 Chassis keeps pace with motor, J. E.; Schipper, diags Automobile 32:882-3 My 20 '15 Crane-simplex a high power design, il diags Automobile 33:414-17+ S 2 '15 Eleven new chassis seen at show, il Automobile 32:12-17+ Ja 7 '15 New Paterson six chassis, il Automobile 33: 388 Ag 26 '15 Pontiac chassis for the trade, il Hosselege Age

Pontiac chassis for the trade, il Horseless Age 35:434 Mr 31 '15
Scientific chassis. A. P. Brush, il diags Automobile 32:802-5 My 6 '15
Simplex-Crane six cylinder chassis, il diags Horseless Age 36:262-3 S 15 '15

Cleaning

Wind-shield cleaner invented by Prince Henry. il Sci Am 113:84 Jl 24'15

## Clutches

Brush clutch works only for one direction of rotation. diags Horseless Age 35:267 F 24 '15 Capacity of leather faced cone clutches; chart. Horseless Age 36:146 Ag 1 '15 Chart for determining the capacity of dry disc clutches. Horseless Age 36:322 O 1 '15 Friction clutches. diags Horseless Age 34:944-6 D 30 '14 Notes on automobile clutches.

D 30 '14
Notes on automobile clutches, W. F. Herst.
Horseless Age 35:797 Je 16 '15
Remedying a slipping clutch, diags Automobile 33:467-8 S 9 '15

## Cost

Why the 1916 cars are cheaper. A. L. Clay den. il diags Automobile 33:593-7+ S 30 '1 See also Automobiles-Price lists

## Cost of operation

Motor vehicles in water-works service at Los Angeles. B. A. Heinly. Eng N 73:861-3 My 6

Small automobile opens up new opportunities in government stream gaging work. E. A. Porter, il Eng Rec 71:490-1 Ap 17 '15

See also Electric trucks—Cost of opera-tion; Motor trucks—Cost of operation

# Design

Automobile drafting room. E. W. Weaver. il diags Horseless Age 34:222-4, 256-8, 297-8, 332-5, 368-70 Ag 5-S 2 '14

Engineering analyses. A. L. Clayden. diags Automobile 32:5-9, 56-9, 103-5 Ja 7-21 '15 Entries vary greatly in displacement. il Automobile 32:884-7+ My 20 '15 500-mile race in retrospect; engineering effect on touring car design. A. L. Clayden. Automobile 32:1016-19 Je 10 '15 (Gyrostatic action. J. G. Gray. il diags Sci Am S 79:172-3, 188 Mr 13-20 '15 (High spots in design. A. L. Clayden. Automobile 33:784-5 O 28 '15 (Maximum loads on automobile road wheel bearings. H. G. Baldwin. diags Horseless Age 36:319-21, 371-3 O 1-15 '15 (Motor house-car. il Sci Am 113:228 S 11 '15 (Racing influence in Delage design. il diag Automobile 33:74-5 Ag 26 '15 (Three-wheeled automobile of unusual design. il Sci Am 113:325 O 9 '15 (Trend of design could be improved. C: E. Davis. Automobile 32:668-9 Ap 15 '15 (What the new models show in design tendencies. E. A. Stephens. Horseless Age 36: 211-13 S 1 '15

See also Automobiles—Fans; Automobiles—Weight

## Differential

Differential gears of unconventional design. il diags Horseless Age 36:70-1 Jl 21 '15 Gearless differential co. adds a type for Ford cars. diags Automobile 32:420-1 Mr 4 '15 Walter differential uses irreversible worm. il Automobile 32:996 Je 3 '15

## Driving

See Automobile driving

## Electric equipment

Automobile electricity. A. L. Clayden, diags Automobile 33:740-3 O 21 '15 Battery-charging methods for electric start-ing and lighting equipments for gasoline automobiles, il Elec R & W Elec'n 66:174-5

automobiles, il Elec R & W Elec'n 66:174-5
Battery systems improved in detail, diags
Automobile 32:284-9 F 11 '15
Bijur electrical units standardized, il diags
Automobile 33:798-9 O 28 '15
Car with electro-magnetic transmission; a
solution of the change-speed gear problem,
il Sci Am 113:465 N 27 '15
Cutter-hammer switch for preventing automobile thefts, il Elec R & W Elec'n 67:538 S 18
'15

Electric auxiliaries on automobiles. G: T. Hanchett. Elec W 64:1196-8 D 19 '14 Electric equipment for Ford cars. il Elec W 66:771 O 2 '15 Electric gear shifter. il Elec W 65:559-60 F

27 '15
Electrical equipment of automobiles. P. M. Heldt. diags Horseless Age 34:530-2, 628-30, 662-5, 692-4, 728-30, 758-61, 790-2, 822-3, 856-7, 888-91, 918-20, 978-81; 35:150-2, 178-81, 210-12, 246-9, 274-7, 312-15, 344-6, 380-2, 412-15, 442-6, 476-8, 544-8, 578-81, 610-11, 678-9, 708-11, 740-2, 775-7, 810-11, 845-7, 882-3; 36:20-1, 47-8, 72-3, 108-9, 148-50, 174-5, 220-1, 274-5, 327-9 O 7, 21-D 30 '14, Ja 27-Ap 7, 21-My 5, 19-O 1 '15

Electrical equipment specifications; details of

the electric lighting and starting systems fitted to American cars during five seasons. Horseless Age 36:364-5 O 15 '15 Electrical instruments in lighting and starting circuits. A. L. Clough. Horseless Age 34:924 D 23 '14

Electricity in the manufacture of electrical machinery, il Elec R & W Elec'n 66:287-9 F

13 '15
Function of the circuit breaker, diag Horseless Age 36:318 O 1 '15
Genemotor; a self-starting and lighting system for Fords. il diag Horseless Age 35:537-8
Ap 21 '15; Same. Automobile 32:742 Ap 22 '15
Genemotor; a single unit starting and lighting system for moderate-priced automobiles.
M. J. Fitch. il diags Gen Elec R 18:384-7 My '15

Gould improved starting, lighting and ig tion battery. il Horseless Age 35:401 Mr igni-

ray & Davis variable-speed generator. il Automobile 31:1106-7 D 17 '14

Automobiles-Electric equipment-Continued

Kutomobiles—Electric equipment—Continued
Kemco electric starting-lighting system for
Ford cars. il Horseless Age 35:96 Ja 20'15
Lifting brush protects generator circuit. Automobile 33:158-9 Jl 22'15
Lighting and starting systems—single and
double unit. Horseless Age 34:943-4 D 30'14
Method of connecting up condenser. Horseless
Age 35:31 Ja 6'15
Nash electric generator and igniter, il Horseless Age 35:37 Mr 17'15
New electrical equipment. Automobile 32:28-9
Ja 7'15
New Westinghouse electrical equipment for
gasoline automobiles. il Elec R & W Elec'n
67:125-6 Jl 17'15
1916 model electrical equipment for automobiles. il Elec W 66:100 Jl 10'15
Probable break in fine winding. Automobile
33:334-5 Ag 19'15
Remy products for 1915, il Horseless Age 34:
975-6 D 30'14
Remy two-armature lighting and starting unit
on national cars. il diag Horseless Age 34:
854 D 9'14
Remairs of automobile electric equipment

on national cars. il diag Horseless Age 34: 534 D 9 '14
Repairs of automobile electric equipment. A. L. Clough, Horseless Age 34:811-12 D 2 '14
Samson electric system for cars under 25 hp. il diag Automobile 33:509 S 16 '15
Simms-Huff motor-generator, il diag Automobile 31:1266 D 31 '14
Splitdorf-Apelco starting and lighting for Fords, il diag Automobile 32:1128 Je 24 '15
Starting and lighting for 1915. il diags Automobile 32:144-9, 200-8 Ja 21-28 '15
Vulcan gearshift stronger and lighter, il diag Automobile 31:1272-3+ D 31 '14
Westinghouse electric equipment for Ford cars, il Elec R & W Elec'n 67:384-5 Ag 28 '15
Wiring diagram of Simms-Huff starting, light-

Wiring diagram of Simms-Huff starting, light-ing and ignition system. Horseless Age 36: 57 Jl 14 '15

Wiring diagram showing the installation of the ammeter on the Delco system. Automobile 33:511 S 16 '15

See also Automobile engines—Ignition de-ces; Automobiles—Lighting; Automobiles— tarting devices; Automobiles—Transmis-Starting sion; Magnetos

## Engines

Sce Automobile engines

## Equipment and supplies

Autorescue. Horseless Age 35:463-4 Ap 7 '15 Business in equipping cars with new acces-sories. A. L. Clough, Horseless Age 35:493-4 Ap 14 '15

Dyneto for Fords, il Automobile 32:1036 Je 10

Equipping the automobile for travel. C: A. Byers. il Sci Am 112:200 F 27 '15
Flexible leather shaft couplings replace metallic type. diags Automobile 32:272-3 F 11 '15
New accessories at the Chicago show. il diags Automobile 32:184-5 Ja 28 '15
New electrical equipment. Automobile 32:28-31
Ja 7 '15
New ideas in automobile accessories. il Sci Am 112:16-17 Ja 2 '15
Novel automobile accessories. il Sci Am 113: 145 Ag 14 '15
Parts exhibits at the Chicago show, il Horseless Age 35:87-90 Ja 20 '15
Portable geared hand-power hoist. il Eng N 74:864 O 28 '15; Eng & Min J 100:733 O 30 '15
Solving the baggage problem. il Automobile

30 '15
Solving the baggage problem. il Automobile 32:366-9 F 25 '15
Speedometers and other indicating instruments at the show. H. H. Brown. il Horseless Age 35:22-3 Ja 6 '15
Storing the tourists' needs. S. Petman. il Sci Am 112:490+ My 29 '15
What the accessory exhibit will disclose: an alphabetically arranged forecast. il Horseless Age 34:955-66 D 30 '14

See also Automobile horns; Automobile mufflers; Automobiles—Electric equipment; Automobiles—Feeding systems; Automobiles—Radiators; Automobiles—Windows; Brakes, Automobile; Carbureters; Shock absorbers; Tire pumps; Tires (automobile)

#### Exhibitions

Boston's combination show; list of exhibi-tors, il Horseless Age 35;324b-324d Mr 10 '15 Business and entertainment vied at Chicago, Business and entertainment vied at Chicago.
C. S. Ricker. il diags Horseless Age 35:158c60 F 3 '15
Closing the national show circuit. il diags
Automobile 32:175-7 Ja 28 '15
How to get the most from the shows. Horseless Age 34:843 D 9 '14
Motor car exhibits at the Panama exposition.
C. L. Edholm. il Horseless Age 36:35-9 Jl
14 '15
N. A. C. C. exhibits.

N. A. C. C. exhibitors, plans Automobile 33:

New car exhibits at Chicago. il Horseless Age 35:85-90 Ja 20 '15

35:85-90 Ja 20 '15
New car models seen at the Palace show. il diags Automobile 32:1-4 Ja 7 '15
Palace ready for fifteenth national show, il Horseless Age 34:933-7 D 30 '14
Palace show a brilliant spectacle. J. T. Shaw. il Horseless Age 35:9-11+ Ja 6 '15
Second national show of season opens at Chicago. C. S. Ricker, il Horseless Age 35:131-4 Ja 27 '15
329 cars and trucks at Boston show. il Automobile 32:442-4+ Mr 11 '15

Fan design remains unstandardized. J. E. Schipper, diag Automobile 33:654-5 O 7 '15

# Feeding systems

Carter tank, diag Automobile 32:1066 Je 17 '15 Fuel feed, Horseless Age 34:952 D 30 '14 New suction feed system, il Automobile 32: 290 F 11 '15

Stewart vacuum feed gasoline system. diag Horseless Age 35:55 Ja 13 '15 Vacuum gasoline feed for automobiles. G. Adams. Sci Am 113:95 JI 31 '15

#### Fenders

See Motor trucks-Fenders

#### Frames

Frame sections report. diags Horseless Age 35:

73 Ja 13 '15 Stamping plant for quantity production. F. L. Prentiss. il Iron Age 95:489-94 Mr 4 '15

See Automobile engines-Fuel

## Gearing

Chain camshaft drives pros and cons of roller and silent type chains, A. L. Clayden. Automobile 22:712-13 Ap 22 '15

Development of heat treatment. R. R. Abbott. 11 Sibley J 29:150-6 F '15; Abstract. Met & Chem Eng 13:390-1 Je '15

Elliminating the greatest problem. Automobile 22:540-1 Mr 25 '15

Friction drive. Horseless Age 35:374 Mr 17 '15

Front wheel drive design diag Automobile 22:

Friction drive. Horseless Age 35:374 Mr 17 '15
Front wheel drive design, diag Automobile 32:
683 Ap 15 '15
Gear box location; final drive, il Horseless Age
34:346-8 D 30 '14
Gear calculations, Horseless Age 35:781 Je 9

Gearsets are smaller and lighter, diags Automobile 33:917-20 N 18 '15
Lapping bevel driving gears, A. A. Dowd, diag Horseless Age 35:216-17 F 10 '15

mobile 33:917-20 N 18 '15
Lapping bevel driving gears. A. A. Dowd, diag Horseless Age 35:216-17 F 10 '15
Magnetic gear shift for gasoline automobiles, if Elec R & W Elec'n 67:857-8 N 6 '15
Making the spiral bevel gear, if Automobile 32:357-60 F 25 '15
Manufacture of worm gearing by a new process: a comparison of the straight and hourglass type of worms. C. T. Myers, if diags Horseless Age 35:116-21 Ja 20 '15
Motor speeds and gear ratios. Automobile 32:1030 Je 10 '15
Russel internal gear drive axle, diag Automobile 32:313 F 18 '15

1030 Je 10 '15
Russel internal gear drive axle, diag Automobile 32:313 F 18 '15
Silent chain drives on increase, diags Automobile 32:314-15 F 18 '15
Spiral type bevel gears for automobile drives.
A. L. Stewart, Horseless Age 35:301-2 Je A. L. Stewart. Horseless Age 35:801-2 Je 16 '15; Discussion. Automobile 32:1110-11 Je 24 '15

Vulcan gearshift stronger and lighter, il diag Automobile 31:1272-3+ D 31 '14

Automobiles—Gearing—Continued Worm gear efficiency, C. H. Calkins, il Horse-less Age 34:982 D 30 '14

See also Automobiles—Clutches; Automobiles—Differential; Automobiles—Steering gear; Automobiles—Transmission; Motor trucks—Gearing

## History

Rise of the automobile. il Sci Am 112:521-2+ Je 5 '15

#### Inspection

Can we improve the inspection system? D. R. Stevens. il Horseless Age 36:65-8, 101-4 Jl 21-28 '15

Lighting

Automobile searchlamp with outside focusing adjustment, il Elec W 66:880-1 O 16 '15 Bend headlight supports to throw glare on road, C: H. Kirby, Automobile 32:625 Ap 8

Bosch standard lighting outfit. il plan Automobile 33:966-7 N 25 '15
Bulbs, sockets, lamps and dimmers. P. M. Heldt. diags Horseless Age 35:775-7, 810-11, 845-7 Je 9-23 '15
Culver-Stearns Ford lighting outfit. diag Horseless Age 35:377-8 Mr 17 '15
Deflecting rays downward. Sci Am 112:345 Ap 10 '15

10 '15
Electric headlights on new Fords. il Automobile 32:579 Ap 1 '15
Glare-free electric lamps for automobiles. il Elec R & W Elec'n 67:910 N 13 '15
Report on British lamp standards. diag Automobile 32:489 Mr 18 '15
6-volt single-wire lighting leads. diags Automobile 32:674-5 Ap 15 '15
Suggested remedy for the headlight nuisance.
A. C. Stewart, Horseless Age 35:144-5 Ja 27 '15
Swivel-bulb automobile lamp reducing glare

Swivel-bulb automobile lamp reducing glare. diags Elec W 66:1222 N 27 '15 Wiring of battery lighting system. plan Auto-mobile 33:201 Jl 29 '15

## Lubrication

Chart illustrating the proper lubrication of the standard motor car chassis; with explanation, il Sci Am 112:18 Ja 2 '15 Oiling system of 1913 Pope-Hartford, plan Automobile 32:850 My 13 '15 Preventing leakage of grease from rear axle and over-oiling of front cylinder. Horseless Age 36:176-7 Ag 15 '15

## Manufacture

Aluminum in automobile chassis. A. L. Clayden; J. E. Diamond. Automobile 33:330-1 Ag 19'15

den; J. E. Diamond, Automobile 33:330-1 Ag 19'15

Assembling motor cars in Packard plant, il Iron Age 96:873-6 O 14'15

Automobile foundry core-room economies, il Iron Age 95:131-3 Ja 14'15

Die casting vs. machining. J. E; Schipper, il diags Automobile 33:451-4 S 9'15

Electricity in an automobile assembling plant, il Elec R & W Elec'n 66:329-31 F 20'15

Electricity in the automobile industry. F. M. Kimball, Gen Elec R 18:550-2 Je'15

Ford methods and the Ford shops, H. L. Arnold; F. L. Faurote, il Eng M 47:1-26, 179-203, 331-58, 507-32, 667-92, 857-86; 48:33-60, 187-212, 338-66, 524-50, 704-21, 859-76; 49:67-87, 184-201, 372-93 Ap '14-Je'15

Franklim—careful design gives lightness, diags Automobile 33:639-43 O 7'15

Heat-treating plant for forge shop work, il Iron Age 94:1284-6 D 3'14

Heavy machinery used in building automobiles. Sci Am S 80:279 O 30'15

How scientific design and use of aluminum alloys will cheapen motoring. A. L. Clayden, il diag Automobile 33:225-30 Ag 5'15

How scientific design and use of aluminum alloys will cheapen motoring. A. L. Clayden, il diag Automobile 33:225-30 Ag 5 '15
Malleable iron castings for the automobile industry. R: Moldenke. Horseless Age 35:69-72 Ja 13 '15; Same. Iron Tr R 56:221-4; Discussion. E. Touceda. 56:224+ Ja 28 '15
Modern automobile forge shop; Packard motor car co., Detroit. F. A. Churchill, jr. il plans Iron Tr R 57:829-32+ O 28 '15
Quantity production favors metal body. H. J. Hayes. Automobile 32:37 Ja 7 '15

Rapid finishing of automobile castings. il Iron
Age 94:1282-3 D 3 '14
Stamping plant for quantity production. F. L.
Prentiss. il Iron Age 95:489-94 Mr 4 '15
Steel for modern motor cars. il Iron Tr R 56:
263-7 F 4 '15; Abstract. Ind Eng 15:57 F '15
Steel—its pathology. J. E: Schipper. il diags
Automobile 32:796-800 My 6 '15
Twin machines for Packard rear axles. il Automobile 32:684 Ap 15 '15
Types of automobile crankshaft lathes. J. C.
Spence. Mach 21:569 Mr '15
Types of automobile crankshaft lathes: universal machines for the crankshaft manufacturer and special equipments for the automobile builder. W; O. Strauss. il diags Mach
21:400-3 Ja '15

See also Automobile engines—Manufac-

also Automobile engines—Manufac-Automobile factories; Automobiles— See also Inspection; Automobiles—Springs; Automobiles—Standards

## Mufflers

See Automobile mufflers

#### Noise

Wide variation in the individual judgment of motor car noise. Horseless Age 36:326 O 1'15

#### Painting

Brushless paint shop. G: D. Babcock. il Iron
Age 96:793-6 O 7 '15
Eliminating dust in body enamelling. L. V.
Spencer. il plan Automobile 33:780-3 O 28 '15
Ford methods and the Ford shops. F. L.
Faurote, il Eng M 49:67-87 Ap '15
Radio process japans a car in 3 days, il Automobile 32:278-9+ F 11 '15
6000-kw electric enameling load, il plan Flore

moone 32.218-9+ F II 13 66000-kw electric enameling load. il plan Elec W 65:1702-3 Je 26 '15 Using electric ovens for enameling. il Iron Tr R 57:215 Jl 29 '15

## Price lists

classification of 1915 cars. Automobile 215-19 D 31 '14 Price 31:1215-19 D 31 '14

Price list and reference table of 1915 American pleasure cars. Sci Am 112:26+ Ja 2 '15

# Radiators

Front position for radiator. R. Huff. Automobile 32:714 Ap 22 '15
Glass radiator betrays poor circulation. Automobile 31:1277 D 31 '14
Large radiator capacity does not mean efficiency. H. Greer, jr. Automobile 31:1072-4 D

10 '14
Radiators at S. A. E. metropolitan branch.
Horseless Age 35:114-15 Ja 20 '15
Radiators not designed by formulae. Automobile 32:1124 Je 24 '15
Repairing and testing automobile radiators, diag Metal Work 83:473 Mr 26 '15
Two machines for automobile radiators. il Iron
Age 96:242-3 Jl 29 '15

# Registration

has systematic registration. Pennsylvania G: A. Quickel. Automobile 32:161 Ja 21

# Remodelling

Remodelling cars for commercial uses. diag Horseless Age 34:809-10 D 2 '14

## Repair

Echoes from the repair shop. A. P. Press. Mach 21:576 Mr '15

Mobile repair shops give war service. W. F. Bradley. Automobile 33:884-5 N 11 '15 Turning and slotting starter commutators in the repair shop. D. A. Hampson. Horseless Age 35:197 F 10 '15

See also Automobile engines-Repair

## Safety devices

See also Automobile signals

## Second-hand

Buying a second-hand automobile. V: W. Pagé. diag Sci Am S 79:260-2 Ap 24 '15 What becomes of the second-hand automobile? il Sci Am 112:435+ My 8 '15

# Service stations

See Automobile service stations

## Automobiles — Continued

#### Shinment

Shipping 2000 cars a day, M. Braun, il plan Automobile 33:646-9 O 7 '15

#### Specifications

Passenger cars for 1915 listed with their principal specifications. Automobile 31:1220-7 D

## Springs

Compensated cantilever eliminates roll. diags
Automobile 32:186-8 Ja 28 '15
Compensated cantilever springs. il Horseless
Age 35:218-19 F 10 '15
Continuous rotary heat-treating furnace. F. M.
Paull. il Iron Age 96:569 S 9 '15; Same.
Horseless Age 36:234 S 1 '15; Same. Sci Am
113:363 O 23 '15
Improvement of spring systems diagn Auto-

113:363 O 23 '15 Improvement of spring systems. diags Automobile 31:987-8+, 1068-71, 1274-6; 32:26-7, 196-8, 280-3, 321-3+, 361+, 462-4, 590-3, 676-7, 764-7+, 854-6+, 990-3 N 26, D 10, 31, '14, Ja 7, 28, F 11-25, Mr 11, Ap 1, 15, 29, My 13, Je 3 '15; Discussion. 32:502-4, 593+, 630-2, 722+, 810-11, 901-3 Mr 18, Ap 1-8, 22, My 6, New Systems of Spring Systems (15) (15)

20 '15
New system of spring suspension for motor cars, il Engineer 119:142 F 5 '15
Partial and total deflections of leaf springs en masse. D: Landau and A. Golden, Horseless Age 35:104-7, 153-4, 213-15, 250-2, 278-81, 316-18, 383-6, 416-18, 447-9 Ja 20-27, F 10-24, Mr 3, 17-31 '15
Pager springs diggs Horseless Age 34:952-2 D. Pager springs diggs Horseless Age 34:952-2 D.

Rear springs, diags Horseless Age 34:952-3 D

Relative deflections of semi-elliptic and floating cantilever springs. A. Golden, Horseless Age 35:266-7 F 24 '15

Science in spring manufacture. A. L. Clayden, il Automobile 32:835-40 My 13 '15 Scientific manufacture of automobile springs. E. C. Arndts. il Horseless Age 34:921-3 D 23

Simple machine for comparing spring action. H. Pastoriza. il Automobile 33:707-8 O 14 '15 Weight and speed suspension factors; discussion. Automobile 32:1118-19 Je 24 '15

## Standards

Standards

Eight S. A. E. standard reports. A. L. Clayden. Automobile 32:745-50 Ap 29 '15

Fan design remains unstandardized. J. E. Schipper. diag Automobile 33:654-5 O 7 '15

Mid-west S. A. E. section in Chicago, diags Automobile 33:736-9 O 21 '15

New S. A. E. standards. Horseless Age 34: 336-8 Ag 26 '14

New S. A. E. standards recommendations. diags Horseless Age 35:831-4+ Je 23 '15

Report of standards committee of S. A. E. Automobile 32:33-6 Ja 7 '15

S. A. E. advances. Automobile 31:1148-9 D 24 '14

A. E. standards committee meeting at Detroit. Horseless Age 35:575-6 Ap 28 '15 A. E. standards committee work. Automobile 32:1112-13 Je 24 '15

A. E. winter session produces six new standards, Automobile 32:83-6 Ja 14 '15 Standardization work in Great Britain. Horseless Age 36:100 Jl 28 '15

## Starting devices

Delco wins in self-starter patent suit. Horseless Age 35:324-324a Mr 10 '15

Eisemann device starts heavy motor when cranked slowly by hand, il diags Automobile 33:431 S 2 '15

Momentary current of starting motors, B: F. Bailey. Horseless Age 35:850 Je 23 '15

Starter drives. P. M. Heldt. diags Horseless Age 36:47-8, 72-3, 108-9, 148-50 Jl 14-Ag 1 '15 Starting an automobile by wireless waves. Sci Am 113:323 O 9 '15

Starting motors, P. M. Heldt, diags Horseless Age 35:882-3; 36:20-1 Je 30-Jl 7 '15

Stewart adds Ford starter, il Automobile 33: 712 O 14 '15

## **Statistics**

See Automobile industry

## Steering gear

Improving the steering A. L. Clayden. diags Automobile 33:407-10 S 2 '15 Pivoted front axle design. A. C. Woodbury, diags Horseless Age 35:419-20 Mr 24 '15 Steering gears offer many problems. A. L. Clayden. diags Automobile 33:913-16 N 18 '15 Steering pivots. C: E. Duryea, diag Horseless Age 35:499 Ap 14 '15

# Steering knuckles

Steel for steering knuckles, E. F. Lake. il Iron Tr R 56:611-12+ Mr 25 '15

#### Stopping

Power required to stop an automobile. W. T. Francis, diag Sci Am S 78:406 D 26 '14

## Taxation

Power formulas used for taxation in different countries. Automobile 32:160-1 Ja 21 '15

#### Terminology

S. A. E. makes progress in nomenclature work. Horseless Age 36:147 Ag 1 '15 S. A. E. suggests standard names. Automobile 33:303 Ag 12 '15 Standardizing names of parts. Automobile 33: 236-7 Ag 5 '15

236-7 Ag 5

#### Testing

Cadillac 8 averages 72.49 miles per hour in A. C. A. tests. Automobile 33:743 O 21 '15 Certified tests by dealers as sales helps. Horseless Age 35:597-8 My 5 '15 Franklin dealers average 32.1 miles per gallon in fuel economy test. Automobile 32:820 My 6 '15

Measuring automobile efficiency, A. B. Browne and E. H. Lockwood, il Automobile 32:374-6 F 25 '15

Official high gear test of Marmon car. il Horseless Age 35:591 My 5 '15
Test automobiles in Detroit on artificial hill. il Eng Rec 72:350 S 18 '15

## Tires

See Tires (automobile)

## Tops

Rex convertible top—Sedan or open car. il Automobile 33:342 Ag 19 '15 Top and upholstery often neglected. M. C. Hillick. Automobile 31:1024-5 D 3 '14 Two demountable top designs. G: J. Mercer. il Automobile 33:963-5 N 25 '15

## Transmission

Transmission

Argo transmission features. Automobile 33: 111 JI 15 '15

Car with electro-magnetic transmission; a solution of the change-speed gear problem. il Sci Am 113:465 N 27 '15

Correct propeller shaft layout. C. W. Spicer. diags Automobile 32:379 F 25 '15

Electrical transmission at S. A. E. Metropolitan section monthly meetings. Horseless Age 35:319-20 Mr 3 '15

Friction losses in the universal joint: abstracts. P. F. Walker and W. J. Malcolmson. Iron Age 94:1438-9 D 24 '14; Am Soc M E J 37:17-20 Ja '15; Automobile 32:378-9 F 25 '15

Hydraulic transmission. diags Horseless Age

Hydraulic transmission, diags Horseless Age 35:234-5 F 17 '15 Owen magnetic; five cars make 800-mile run

owen magnetic; five cars make 800-mile run through mountain sections. il Automobile 33:616-17 S 30 '15

Owen magnetic makes progress. il diags Automobile 33:102-5 Jl 15 '15

S. A. E. gas-electric committee reports. diags Automobile 32:401-4 Mr 4 '15

Universal joint efficiency. C. W. Spicer. Horseless Age 35:74 Ja 13 '15

## Upholstery

Ford methods and the Ford shops, F. L. Faurote, il Eng M 49:67-87 Ap '15 Top and upholstery often neglected, M. C. Hillick, Automobile 31:1024-5 D 3 '14

## Vibration

Car vibration and engine unbalanced forces. L. E. French. Horseless Age 36:52-5 Jl 14

Automobiles Vibration Continued Engine balance and vibration A 1. Clayden dugs Automobile 32 '61 1, 310 13 F 11 B

Problem of uses Vibration damper diag Auto-mobile 21.26 Ag a 4h Twelve' from the standpoint of Albration 12 M Heldi diag Horsele Age 36.2.1.3

#### Weight

Frinklin careful de ign gives lightners diaga Automobile (3.639-4), O. J. Ta. How scientific delign and diec of aluminum allovs will cheapen motoring A. L. Clay den ill Automobile 31 "5 50 Ag a "15 Weight of ears. Hor cless Age 31 34, S. D. 9

#### Wheels

Wheels

Autore one Hor de s Are to 163 1 Ap 7 The
Broad demonstable run patent upheld II
Hor de Are 26 221, 1 1 15

Perfuran win decritor in long confested de
mountable run patent suit Automobile 23
391 5 Ar 5 The
Free of teel which for phermine car to A
Parlier Horsde Are 35 704 Je 16 15

Bur and wheel component of the General
time of 14 Mover if due Horsde Are
25 104 6 Mr 74 15

Pire and fire unitie, run and which at
the New York bow H. H. Brown ditto.
Hor cle. Are 5 65 8 Ju 15 Th
Wire which y wood which G. W. Houk
ditte Horsde Are 5 65 8 Ju 15 Th
Wood which y wire which R. B. Mindge,
Hor ch. Are 25 65 8 Ju 15 Th

Wood which y wire which R. B. Mindge,
Hor ch. Are 25 65 8 Ju 15 Th

See also Automobile Axies, Tires canto

Fig. also Automobiles Ayles, Tires canto

#### Windows

Fulctifule for the in infomobiles Set Am 11, 401 Alv. (-1)

Automobiles, Care of Morna of a machine for the winter Automo-like 31-1164 5 D 24 344

Automobiles, Flectric, See Llectric vehicles
Automobiles, Industrial
Automobile, Industrial
Automobile versi har es in road work super
veilar I W James Line N 3, 69 Ap 23 To
Controller and the automobile G D Crain,
it Lies R & W Electric 6 172 a Atr 6 To
Use of automobiles in wider works service at
Words for Mass G W Eatchelder, Eng &
Controll 333 TO 1 H

Fer also Motor trucks

Automobiles, Military
Automobiles, Military
Austhria, minitary motor cars, il Sci Am S
19/116/14 F 70 Lo
Bibern immored car most efficient W F
Haddev at Automobile 33 S-10 + Jl I 15.
Abetra I ins M 50/98/100 O 15.
France books attorned cars W F Bradley II
Automobile 31 tov, 1101 D 17 14
Princh mont Jamm gun on 30 hp. chassis,
W F Bradley II Automobile 32/30a/9 F
15. Lo

Military tactics and the motor if Sci Am 112:

8 9 TH (1)
Our active wirele informolules C, H Claudy,
H 3 Gl Aro 11 Ars Ms (1)
Fearwhile difference le 1-cr ffre Halian army,
H 3 cl Aro 11; (1) (2) (3)
War truck dose 60 radio per hour H Automolule (2) (60 A) (1)
Sec also Automolule in war, Motor

Motor trucks, Militury

Automobiles, Steam
Motor fuels V 1; Lawes Vm Ci Light I
101 180 1 8 20 15
Stanley steamer has radiator conden or al
plan Automobile 33 306 c Alt 18 18

See also Motor buces, Steam

Automobiles and roads
Heavy motor vehicles wheels and weight
W.W. Beaumout Engineer 119 all My 28 a
Motor truck and the road, who should pay flatorad tax? J. S. Harwhite, if Ser Vm 113/56
J1 1/2 To

Traffic present fendencies, probable development and regulation, A. W. Dean, Good Roads n s 9:55 6 F 6 '45

Automobiles in war

Automobiles in war

American ambulances in the field, if Automobile 3° 266 9 F 11 '15

Cars and truck belief the lines W F.
Bradley if Automobile 32 536 9 Mr 25 '15

Caroline war, uses of motor vehicles close to the front and of methods of keeping them in repair flor dess Age 25:121 2 Mr 24 '15

Milliary to the and the motor, if Sel Am II3: 8.9 | Ja 2' 15

Mobile repair shop give war service. W. F.
Bradley Automobile 32:24 s N II '15

Motor truck in modern military service, if Sel 2m 2', 9 '80 2' My I '15

Ku ana's American motor cars W W Nutsing if Horsels as Age 26:302 s | O I '15

Saving trucks at the front in France W F.
Bradley if Automobile 22:35 s | Ja 14' 15

War trucks arrive in France W. F. Bradley, if Automobile 2' 25 s 1 Ja 14' 15

War trucks arrive in France W. F. Bradley, if Automobile 2' 25 s 1 Ja 14' 15

tee also Ambulance , Automobiles, Mill-tur, Motor eveles in war

#### Aver.uges

Average again J Account 48 471 7 D '14

Aviation, Pec Acronautica

Health requirements for the aeronaut E. Kos-chel Sei Am 3 79 LoJa 46 To

Axle fighting, See Car Inditing

Siles
Care hardened collar and welding reclaim wern button and ask. A & Johnson. If where Like Ev.J. L. 291., P. 6-4.5
How an ask finish in cryace if from Tr. R. as no., 10., Mr. 2., 45.
Progressive ask fractures, 3. W. Miller, Eng. N. (2.3), N. Ap. 29-45.
Reclaiming car asker R. W. Rogers, diag. Ry. Are (Mech. ed.), 88-611. D. 11
Stark ed an asker half for a motor truck. J.: Younger if drags. Am Soc. M. E. J. 2., 45. 69
Aw. L. Same from Tr. R. ac (41), 11. de 21-45.
Crimic cond. Hor class. Aw. 38-11. L. Ag. 1-45.
Ab tract from Age. 96-27, Jl. 1-45, Discussion. Am. 50-31. S. 13.
Thrust plate for worn car axless. Elec. Ry. J. 45:635-Mr. 27, 745.
Why. did. this axle. break? Eng. N. 73:199. Mr.

Why did this axle break? Eng N 53:499 Me

See also Desirings

les, Automobile. Pa Molor truck: Axlen Pee Automobiles Axles; Axles.

# Azlmuth

Zimuth by a comple method J. A. Macdon ald Ling N (1 (29 )00 O 21 '15) Same. Eng & Min J 100 811 N 20 '15
Azimuth observation on Polari by daylight. B A R Reynolds Eng N 13 (29 Ap 22 '15) Same Ung & Min J 99 (76 My 1 '15

the hydrocarbon occurring in some essential oil. A E. Sherndal Am Chem Soc J 37:167-71, 1037-14 Ja, Je 'Lo

Mysterions Baalbek, whose magnificent temples show the hands of many ages and nations Mrs. T. E. Lellage, il Sci Am S 78: 407 10 D 26 41.

Babbitt metal

Composition of babbitt metal. S. U. Tuspin. Elec W 65 169 70 Ja 46 '15

## Babylon

## Antiquities

Resurrection of Babylon C J. Ball. Sel Am S 80 66 J1 31 46

## Babylonia

# Antiquities

Curiosities of bygone agest relies from New Mexico and from Eable lands, il Sci Am 112: 87+ Ju 23 '15

Back filling. See Trenches

Bacteria

Production of light by animals, U. Dahlgren, if J Fr Inst 180:516 37 N '15

Bacteriological incubator Electric bacteriological incubator, il Elec W 65:305 Ja 30 '15

Bacteriology

Bacteriology
Bacterial flora of trees and men. S. J. Maher.
Sci Am S 80:158-60 S 4 '15
Discoveries about bacteria, R. Lankester, Sci
Am S 79:87 F 6 '15
Experiments on life without microbes, J. Boyer, il Sci Am 111:501 D 19 '14
Sampling outfit for bacterial samples, R. S.
Weston, il diag Eng N 72:1265 D 24 '14
Variation in bacteria, E. O. Jordan, Sci Am
113:910 S 4 '15 113:210 S 4 '15

See also Milk—Bacteriology; Soil bacteriology; Water Bacteriology

Badin, North Carolina Factory city beautiful at low cost, il plans Iron Age 95:782-6 Ap 8 '15

Backeland, Leo Hendrik, 1863-Sketch, for Eng M 50:203 N '15

Bag houses

Metallurgical smoke, C: H. Fulton, il diags U S Bur Mines Bul 84:44-59 '15 Treating sulphurous fumes at the Mammoth smelter, A. H. Martin, il Met & Chem Eng 12:769-70 D '14

Baggage. See Electric railroads-Baggage

Baggage and express cars

Baggage-buffet cars for the Union Pacific R.
R. diags Ry R 56:9-10 Ja 2 '15
Jersey Central steel baggage and mail equipment. il diags Ry Age 58:301-4 F 19 '15;
Same. Ry Age (Mech ed) 89:123-7 Mr '15
Steel dynamo-baggage cars for the Union
Pacific R. R. il diag Ry R 56:469 Ap 3 '15

Baghouses. See Bag houses

Bagley scraper. See Road making machinery

Bahia, Brazil

Electrical opportunities in Brazil. H. N. Douth-itt, Elec W 66:425-6 Ag 21 '15

Facts

acts about baize. J. Strand, Textile World 49:663-4 S '15 Bakelite

Bakelite suit decision. Met & Chem Eng 13: Bakers and bakeries

Electricity in a wholesale grocery establishment, it blee R & W Elec'n 67:503-6 S 18 '15 Electricity in bakeries, il Elec R & W Elec'n 66:715-21 Ap 17 '15 Power plant of the Acme tea company, il plans Power 40:906-10 D 29 '14

Sec also Pies

Baking powder Determination of carbon dioxide in baking powder and carbonates. H. W. Brubaker. diag J Ind & Eng Chem 7:432-3 My '15 Egg albumin in baking powder. H. L: Jackson. J Ind & Eng Chem 6:998-1001 D '14

Balancer sets

Direct-current three-wire systems. G. Fox. diags Power 41:505-8 Ap 13 '15 Balances. See Scales

Balata

Balancing machines
Dynamic balancing machine, il diags Mach 22:
70-1 S '15

Balata industry, il Sci Am S 80:172-3 S 11 '15 Balconies

ive examples of cantilevered auditorium balconies. diags Eng Rec 72:234-5 Ag 21 '15

Balkan states Ralkan frontiers; complex problems that do not conform to race distinctions, Sci Am S 80:307 N 13 '15 Strategic moves of the war, M: E. Hanna.

map Sci Am 113:180 Ag 28 '15

Ball bearing separators
Die-casting mold for ball bearing separators. Die-casting mold for k il Mach 21:365 Ja '15

Ball bearings Ball bearing for lighthouse use, il diag Mach 21:571 Mr '15

Ball bearing tests involve accurate apparatus. A. V. Farr. il diags Automobile 33:514-16 S

Ball bearings for cotton mills. E. A. Allen. il Textile World 49:631-8 S '15
Ball bearings in electric motors, il diag Elec W 66:658-9 S 18 '15
Ball bearings in electric motors. F: H. Poor. il diags Gen Elec R 18:631-5 Jl '15
Ball bearings in theory and practice. B. D. Gray. diags Automobile 32:846-9, 896-9+My 13-20 '15; Same. Horseless Age 35:673-5, 713-14 My 19-26 '15
Ball bearings on electric railway cars; abstract. R. Zehnder-Spoerry, diags Am Soc M E J 37:230-1 Ap '15
Design and operation of ball bearings. B. D. Gray. il Mach 21:852+ Je '15; Same cond. Iron Age 96:300-2 Ag 5 '15
Economies of the light car and of ball bearings. A. V. Farr. Elec Ry J 46:239-40 Ag 7 '15

an trouble solved by ball bearings. F. E. Rogers, jr. il diag Textile World 49:569-71 Ag '15

Hollow steel bearing balls. M. E. Canek; L. J. Hoover. Mach 21:743-4 My '15 Hosiery mill's experience with ball bearings. R. C. Byler. il Textile World 49:378-80 Je

R. C. Byler, il Textile World 49:3/8-50 Je

1/5

Lubrication of ball bearings, A. V. Farr, Elec

W 65:925-6 Ap 10 '15

Lubrication of ball bearings, L. G. Long, Mach
21:914-15 Jl '15

Most accurate, automobile part; methods of
ball bearing manufacture call for microscopic inspection of material and product.

A. L. Clayden, il Automobile 32:701-5 Ap
22 '15

Norma ball bearings now made in America.
Eng M 50:sup2-3 O '15

Pitch diameters of ball bearings, G: C. Hannemann, Mach 21:372 Ja '15

Relation between axial and radial load on
ball bearings, J. Fischer-Hinnen, Am Soc
M E J 37:288-9 My '15

Special ball bearings for lighthouse, il diag Iron
Age 95:138 Ja 14 '15

Use of ball bearings on Swedish railways,
diags Ry R 56:600 My 1 '15

See also Ball bearing separators; Bearings

See also Ball bearing separators; Bearings

Ballasting economy, il Elec Ry J 46:682 O 2'15
Blast furnace slag for railway ballasting. il
plan Engineer 120:395-6 O 22 '15
Burned-clay ballast. Eng N 73:103-4 Ja 21 '15
Burnt clay or gumbo ballast. A. M. Van Aucken. Ry R 56:365-7 Mr 13 '15
Characteristics of slag and chat ballast. P. H.
Hamilton. Ry Age 58:1437-8 Je 18 '15
Cleaning stone ballast with screens. H. M.
Church. il Ry Age 58:1436-7 Je 18 '15
Economical operation of a gravel ballast pit.
Ry Age 59:117-19 Jl 16 '15
Mechanical life of ties as affected by ballast.
E. Stimson. Eng Rec 71:105-6 Ja 23 '15;
Same. Ry Age 58:161 Ja 22 '15; Same. Ry R
66:119-21 Ja 23 '15
Relative efficiency of various ballast materials.
G. W. Vaughan. diag Ry Age 59:123-4 Jl 16
'15

Report of A. R. E. A. committee. Ry R 56:400-1 Mr 20 '15 Results gained with a ballast dresser, if Ry Age 59:529-30 S 17 '15 Stone ballasting by contract, J; Evans. Ry Age 58:1436 Je 18 '15

See also Railroads -Track

Ballistics

Penetration of bullets. E: C. Crossman. il Sci Am 113:404+ N 6 '15

See also Projectiles

Balloons and airships Airship in the field. il Sci Am S 79:200 Mr 27

Government's competition for a naval dirigible. C. Dienstbach. Sci Am 112:405 My 1

Law of similarity and balloon models; abstract. C. Wieselsberger. Am Soc M E J 37: 712-13 D '15

Military value of airships. Sci Am 112:94 Ja

Our first naval dirigible, C. Dienstbach, il Sci Am 113:44 Jl 10 '15

Balloons and airships-Continued

Problems of airship design and construction.
Sci Am S 80:107 Ag 14 '15
Use of balloons during the siege of Paris,
1870-1; table and charts showing number of
ascensions and results. Sci Am S 80:229 O 9

Using air for ballast, R. H. Upson, Sci Am S 80:142 Ag 28 '15
Zeppelin, Sci Am 113:8 JJ 3 '15
Zeppelin question; facts and figures indicating the number and capacity of the air fleet. G. Prade, Sci Am S 79:214-15 Ap 3 '15

See also Aeronautics

Turning a ball on the milling machine. G: Slider, diag Mach 21:497 Ja '15
Weight of balls or spheres. W. L. Tryon,
Foundry 43:356a S '15

Balls, Steel
Tolford ball grinding machine, C. L. Lucas. il
diags Mach 21:311-14 D '14

Canada balsam. Sci Am 112:470 My 22 '15

Baltimore, Maryland

Bridges

Construction of the Gwynn's Falls arch bridge. il diag Ry Age 57:1037-40 D 4 '14 Fallsway viaduct in Baltimore built on sharp curve with concrete from 205-foot tower, il diags Eng Rec 71:544-6 My 1 '15

Finance

Annual budget. W: T. Childs. Munic J 39:545-

Sewerage

Additions to the Baltimore sewage-works, il diag Eng N 74:278-9 Ag 5 '15
Baltimore filtration plant placed in service this week, il Eng Rec 72:369-70 S 18 '15
Baltimore sewage-pumping plant, W. O. Rogers, il Power 41:76-8 Ja 19 '15

Streets

Baltimore experience in paving street-rail-way tracks. H. D. Williar, jr. il diags Eng N 73:884-5 My 6 '15' Paving methods in Baltimore. H. D. Williar, jr. il Eng & Contr 42:344-6 O 7 '14

Water supply

Baltimore filters abound in useful hints on concrete construction and design. J. W. Armstrong. il plans Eng Rec 71:583-6 My

8 '15
Baltimore water filtration plant, il plan diags
Munic J 38:537-41 Ap 22 '15
Design features of the Montebello water filters, il Eng & Contr 44:198-9 S 15 '15
Placing a jointed concrete pressure pipe inside a brick tunnel for water-supply, Baltimore, il diags Eng N 73:600-2 Mr 25 '15

Baltimore & Ohio railroad

Eighty-ninth annual report, map Ry Age 59: 930-1, 988-90 N 19 '15

Magnolia cut-off improvement on the Baltimore and Ohio railroad, A. W. Thompson, il diags maps Eng Soc W Pa 30:809-933 D '14; Abstract. Ry Age 58:934-8 Ap 30 '15

Operation by signals on Baltimore & Ohio, diags Elec Ry J 46:434-5 S 11 '15

Baluchistan

British India. il U S Sp Cons Rep 72:474-82 '15 Balustrades. See Railings

Banana flour

Banana flour, a new substitute for wheat and rye flour. Sci Am 113:35 Jl 3 '15

Bananas

Unloading bananas by machinery, il Sci Am S 79:209 Ap 3 '15

Bandages

Cameron process for slitting and winding strips for surgeons' bandages and other purposes, il Textile World 48:346-50 D '14

Bank architecture. See Bank buildings

Bank buildings

F. L. Godinez. il Arch & Bldg Bank lighting, F 47:256-64 Jl '15

Banking house of J. P. Morgan & co. il plans Arch & Bldg 47:5-14 Ja '15

First national bank of Appleton, Wis. il plan Arch & Bldg 46:485-8 D '14 Hartford national bank, Hartford, Connecti-cut; views and plans. Brickb 24:pl 16-18 F '15

Heavy trusses and foundation girders used in steel bank building, diags Eng Rec 71:713-14 Je 5 '15

Je 5 '15
National bank at Far Rockaway, L. I.; views and plan. Brickb 24;pl 116 Ag '15
New quarters of the Chase national bank, New York. il Arch & Bldg 47:15-20 Ja '15
Plumbing system in Bridgeport bank building. il Metal Work 84:462-3 O 8 '15
Portfolio of current architecture. il plans Arch Rec 38:253-61 Ag '15
Recent bank plans: the work of Thomas Bruce Boyd. J: J. Klaber. il plans Arch Rec 37:97-115 F '15
Remaking a building for a bank: Holyoke Remaking a building for a bank; Holyoke national bank, il plans Arch & Bldg 47:246-

54 Jl '15

See also Vaults

Bank protection. See Rivers-Regulation

Bankers' club of America Rooms of the Bankers' club of America, il Arch & Bldg 47:184-7 My '15

Bankruptcy
United States mining statutes annotated.
J. W. Thompson. U S Bur Mines Bul 94:pt 2,
914-15 '15

See also Commercial law

Banks, Federal reserve. See Federal reserve act

act
Banks and banking
Banking and credit in Argentina, Brazil, Chile,
and Peru. E: N. Hurley. U S Bur For & Dom
Com 90:1-72 '14
Federal reserve banks and the reserve agent.
F. B. Snyder, J Account 20:28-33 Jl '15
Inventors' bank. Sci Am S 79:262 Ap 24 '15
War and the British engineer: effect of the
British banking system. Engineer 118:51213 N 27 '14

See also Bank buildings; Credit; Federal reserve act

Accounting

Credits from the viewpoint of a certified public accountant. F: H. Hurdman. J Account 18:435-54 D '14
Verification of depositors' accounts in banks. C: Neville. J Account 19:137-8 F '15

Barbed wire entanglements

Blowing up barbed wire entanglements: the poles bearing explosives used by the French, Russian and English armies. il Sci Am 111: 468-9 D 5 '14

Barfoed's test
Disturbing factor in Barfoed's test. W:
Welker, Am Chem Soc J 37:2227-30 S '15

Barges

estern river steamers and barges. E. A. Burnside, il plan Int Marine Eng 20:478-87 N '15

Barges, Concrete

barges built for the Panama canal. W. Row-land. diags Eng Rec 71:684-6 My 29 '15 Experiences

Barges, Motor. See Motor barges

Barite of the Appalachian states. T: L. Watson and J. S. Grasty. bibliog il diags maps Am Inst Min E Bul 98:345-90 F '15

Barytes at Kings Creek, S. C. J. H. Watkins. il Eng & Min J 99:1074-5 Je 19 '15

Barium

Barium industry in the United States since the European war. M. Toch. J Ind & Eng Chem 7:993-5 N '15; Abstract. Met & Chem Eng 13:710 O 15 '15

Two methods of separation of the metals of the alkaline-earth group. A. G. Paterson. Am Chem Soc J 37:2346-52 O '15

Barium sulphate

Results of some co-operative work on deter-mination of sulfur in pyrites. H, C. Moore, J Ind & Eng Chem 7:636 Jl '15

Barns. See Stables

Barometers

arometers
Aneroid barometers in power houses. P. R:
Jameson. Power 42:204 Ag 10 '15
Direct-reading barometer. M. Sampson, diag
Power 42:164 Ag 3 '15
Measurements for the household, il diag U S
Bur Stand Circ 55:118-21 '15
Modified precision barometer. A. F. O. Germann, il Am Chem Soc J 36:2456-62 D '14

Barrels New wooden barrel machine, il diag Iron Age 95:794-5 Ap 8 '15

Bascule bridges. See Bridges, Bascule

Anchoring base plates for columns. D. N. Becker, Eng Rec 70:626 D 5 '14
Anchoring base plates for columns. E. F. Allbright. Eng Rec 70:678 D 19 '14
Inexpensive base plate pattern. S. B. Phelps. diags Foundry 43:466+ N '15

Baseball

Baseball
Electrical ball pitchers for indoor batting
practice, il Sci Am 113:364 O 23 '15
Power of mind in baseball, A. Macdonald.
Sci Am 112:462+ My 15 '15
Psychology of baseball, A. Macdonald. Sci Am
113:188+ Ag 28 '15
Psychology of batting in baseball, A. Macdonald. Sci Am
113:188+ Sai Am 113:140 baseball, A. Macdonald.

Psychology of batting in baseball. A. Macdonald. Sci Am 112:440+ My 8 '15 Statistics of baseball. A. Macdonald. Sci Am 112:418+ My 1' '15

Stealing bases in baseball as a psychologist sees it. A. Macdonald, Sci Am 113:53+ J1 10

Baseball grandstands. See Grandstands

Baseball parks

National league ball park at Boston, Mass. il diags Eng N 74:374-7 Ag 19 '15 National league baseball park of reinforced concrete at Boston. W. B. Conant. il diags Concrete Cem 7:53-5 Ag '15

Basket willow. See Osiers

Bassano dam

America's greatest irrigation project; Bassano dam, southern Alberta, Z. E. Black. il Sci Am 113:252-3 S 18 '15

Municipal bat-roost, il Sci Am 113:83 Jl 24 '15

Bates, Lindon Wallace, jr., 1883-1915 Sketch. por W Soc E J 20:548-51 Je '15

Bath cars Bath trains of the Russian army, il Sci Am 113:13 Jl 3 '15; Same, Metal Work 84:363-4 S 17 '15

Russian bath trains. Ry Age 58:378-9 F 26 '15 Bath houses

Fordyce bath house, Hot Springs, Arkansas. il plans Brickb 24:283-4 N '15 Bathing beaches Projector lighting for the protection of bathing beaches. il Elec R & W Elec'n 67:485 S 11 '15

Batholith. See Boulder batholith Bathrooms High-grade bathrooms in Chicago mansion. il Dom Eng 71:37-8 Ap 10 '15

Baths, Public
Los baños del mar—the baths of the sea at
Santa Barbara. il plan Metal Work 84:4345+ O 1 '15

Municipal baths in the United States. iI Dom Eng 71:331-4 Je 19 '15

New municipal bath house in Cleveland. il plan Metal Work 84:180-3 Ag 6 '15

New York city's public baths. Munic J 38:689 My 20 '15

Public bath an Americanizer. Dom Eng 69: 296 D 5 '14

Public bathing establishments, il plans Brickb 24:13-16, pl 4, 6-7 Ja '15

Small public bath house in Louisville, Kentucky; plumbing and heating; disposal of waste, il plan Metal Work 83:561-3 Ap 16

Baths and bathing Lincoln baths rival continental pools, il plan Metal Work 84:307-8 S 3 '15

Shall we take a cold bath to cool off after exercising? Sci Am 113:373 O 30 '15

See also Bath cars; Bathrooms; B Public; Shower baths; Swimming pools

Baths in public schools

Baths in the public schools. Dom Eng 70:135
Ja 30 '15 Ja 30 15 Shower baths in the schools. J. Graham. il diags Dom Eng 70:233-5 F 20 '15 Shower equipment in Jersey schools. plans Metal Work 83:837 Je 11 '15

Malarial mosquitoes as the food of bats, C: H. R. Campbell. il Sci Am 113:425 N 13 '15

Batteries (electric). See Electric batteries; Storage batteries

Battles

See also Naval battles: War

Battleships, See Warships

Bauxite

Occurrence and origin of the bauxite deposits of Arkansas. W. J. Mead. pls Econ Geol 10:28-54 Ja '15

Bay windows

Home instruction for sheet metal workers. W: Neubecker. il diags Metal Work 84:171-3, 297-8, 423-4, 581-2, 702-4+ Ag 6, S 3, O 1, N 5, D 3 '15

Bayberries

Myrtle wax of commerce, il Sci Am S 80:301

Beacons

Sec also Lighthouses

Beams. See Girders

Bearings

Automobile engine bearings. W. Betterton. Horseless Age 35:517-18+, 549-51 Ap 14-21 Babbitt bearing mold. D. S. Mann, diags Mach

22:146-7 O '15 Babbitt bearing mold. S. Sucram. diag Mach 21:582 Mr '15 Babbitt spindle bearing. diags Mach 21:317-18

D '14
Bearing-babbitting furnace, J. C. Donovan, il Elec Ry J 46:153 Jl 24 '15
Bearing metal of high elastic limit, il Eng M 49:sup1-2 Ag '15
Bearing metals, Metal Ind n s 13:473-4 N '15
Bearings for electric motors, L. F. Adams, Am Inst E E Pro 34:2797-802 N '15
Parrings for shefts, etc. diag Int Marine Eng

Bearings for shafts, etc. diag Int Marine Eng 19:567 D '14

Bearings for shafts, etc. diag Int Marine Eng 19:567 D '14
Bound Brook and Nigrum oilless bearings. il Textile World 49:282-4 My '15
Chart for safe load on journal bearings. A. M. Bennett. Mach 21:321-2 D '14
Friction load of shaft bearings. Elec W 66: 809-11 O 9 '15
Heating of generator bearings. Elec R & W Elec'n 66:78-9 Ja 9 '15
High speed bearings. G. Stoney. Int Marine Eng 19:570 D '14
Hot trailer bearings. diag Ry Age (Mech ed) 89:565-6 N '15
Hydraulic bearing-broaching machine. C. M. Feist, il Elec Ry J 46:191 Jl 31 '15
Laws of lubrication of journal bearings. M. D. Hersey. Am Soc M E J 37:534-7; Discussion. 37:537-8 S '15
Lubrication of car journals. W. A. Clark. Ry

Age (Mech ed) 89:19-20 Ja '15 Lubrication of journal bearings. Iron Age 96: 25-6 Jl 1 '15

25-6 Jl 1 '15
Motor-bearing trimmer. E. L. Stephens. il
Elec Ry J 46:111 Jl 17 '15
Need of standard railroad car-bearing alloy.
R. R. Clarke. Foundry 43:457-8 N '15

New machine for making wire nails, il diag Iron Age 95:792-3 Ap 8 '15

One-ball center bearing. J. S. Witt. diag Elec Ry J 46:770 O 9 '15

Rapid analysis of bearing metals and high-copper content alloys. C. G. Lutts. Met & Chem Eng 13:346-7 Je '15

Rebabbitting journal bearings. W. L. Fulton. il diags Elec Ry J 44:1305-6 D 12 '14

Setting up connecting-rod bearings. Automobile 33:242-3 Ag 5 '15

Bearings -- Continued

Tri-city railway bearing practice. J: Suther-land. il Elec Ry J 45:844-5 My 15'15 Types of motor axle bearings—use of differ-ent types for each half. Elec Ry J 45:760 Ap

See also Babbitt metal; Ball bearings; Lubrication and lubricants; Roller bearings

## Beaumont, Texas

## Public works

New marine terminals at Beaumont; abstracts. H. M. Harding, plan Eng N 73:1072-3 Je 3 '15; Eng & Contr 43:sup28 My 19 '15; Eng Rec 71:721 Je 5 '15; Int Marine Eng 20:299-300 Jl '15; Ry R 57:679-81 N 27 '15

Bedplates. See Machinery-Foundations

Beer-yeast. See Yeast

Bees

Bee in winter time. Sci Am 113:217+ S 4 '15 Beet sugar industry. See Beets and beet sugar

Seets and beet sugar
Strontium in the beet sugar industry. H. C.
Meyer. J Ind & Eng Chem 6:1036 D '14
Sugar beet cultivation in England. Sci Am S
80:11 Jl 3 '15

Belgian Kongo, See Kongo, Belgian

Belaium

Belgium, R. A. Cram. Am Inst Arch J 3: 185-6 Ap '15 Report of a German commission upon the

leport of a German commission upon the destruction of architectural monuments in Belgium. R. D. Kohn. Am Inst Arch J 3:130-2 Mr '15

## Defenses

Defense of Belgium by inundation. P. Sallior. il map Sci Am S 79:166 Mr 13 '15

#### Description

Belgium and some of its buildings. J: Y. Dunlop. il Bldg Age 37:33-6 Ap '15

## Industries and resources

Belgian car factories intact. W. F. Bradley. il map Automobile 32:99-101 Ja 21 '15
Belgium's place in the industrial world. A. A. Snowden. Am Ind 15:22-3 My '15
Forests of Belgium. C: H. Whitaker. il Am For 21:22-32 Ja '15
Manufacture of chicory. J. Boyer. il Sci Am S 80:40-2 Jl 17 '15
Prostration of Belgian industry is complete. D: E. Sasseen. Iron Age 95:894-5 Ap 22 '15

## Social conditions

Housing reform in Belgium. C. Aronovici, il Am Inst Arch J 2:568-72 D '14

## War relief

World's largest soup kitchen. Sci Am 112:329
Ap 3 '15 Ap 3

Bells

Cross-section of bell founding arrangement. J. E: Schipper, diag Automobile 33:370 Ag 26 '15

Bells, Electric. See Electric bells

Belting

Belt driving. H. T. Millar, diags Engineer 119:396-7, 421-2 Ap 23-30 '15 Belt shifter, il Ry Age (Mech ed) 89:543-4 O '15

Belting calculations. E. O. Waters. Power 41:543-4 Ap 20 '15 Centrifugal effect on belts. C: A. Hirshberg. il Power 40:927 D 29 '14

Conveyor-belt calculating chart. J. D. Mooney and D. L. Darnell. Am Inst Min E Bul 105: 1937-9 S '15: Same. Eng & Min J 100:562-3 O 2 '15; Same. Met & Chem Eng 13:818-19 N 1 '15; Abstract. Am Soc M E J 37:610-11 O '15

Device for taking slack out of belts, il Iron Age 96:1240 N 25 '15 Driving belts, W: T. Estlick, Elec R & W Elec'n 67:973-4 N 27 '15

Effect of relative humidity on an oak tanned leather belt. W: W. Bird and F. W. Roys. il Am Soc M E J 37:447-9 Ag '15; Same. Iron

Tr R 56:1315-17 Je 24 '15; Same. Power 42: 169-71 Ag 3 '15; Summary. Iron Age 96:26-7 Jl 1 '15; Discussion. Am Soc M E J 37:449-51

Ag '15 Largest Lenix drive in the United States. il diag Power 42:230-1 Ag 17 '15 Leather belts at Panama exposition. il plan Iron Age 95:564 Mr 11 '15 Lenix belt wrapper. il Eng M 49:sup1-2 Ap

'15
Lenix drive. il Eng M 49:sup2-3 Ag '15
Manufacture of leather belting. F. H. Small.
Am Soc M E J 37:679-82 D '15
Paeschke adjustable sheet metal guard for
belts. diags Iron Age 96:973-4 O 28 '15;
Metal Work 84:582 N 5 '15
Quarter-turn belt. W. F. Schaphorst. diags
Power 42:555-6 O 19 '15
Rubber-belt data. Eng & Min J 98:1098 D 19

Safety belt shifter, il Elec R & W Elec'n 67: 635 O 2 '15; Power 42:608 N 2 '15; Ry Age (Mech ed) 89:597 N '15 Static electricity in a textile mill. W: T. Est-lick, diag Elec R & W Elec'n 67:231 Ag 7

Study of belt drives. M. Sampson. Mach 21: 805-6 Je '15

See also Pulleys; Rope driving; Shafting

Belting, Steel
Steel-band power transmission; advantages
over belt and rope shown in Germany. F. G.
Broeker. Eng M 49:756-7 Ag '15

Belting, Woven
Finishing of belting fabrics. diag Textile
World 49:684-5 S '15 Benches, Concrete

Concrete park seats. W. B. Conant. il diag Munic J 38:592-3 Ap 29 '15 Benchmarks

enchmarks
Granite benchmarks on piles. C. B. Adams.
diag Eng N 73:443 Mr 4 '15
Improved method of setting bench mark for
determining hydraulic slope in channels. il
Eng & Contr 44:271 O 6 '15
New street line monuments at Pittsburgh, Pa.
diag Eng & Contr 43:574 Je 30 '15
Precise-level benchmarks, New York city.
diags Eng N 74:222-3 Jl 29 '15

Bending machines

Bending bows for vehicle tops. il Sci Am 111: 511 D 19 '14

Curving rail with power bender, diags Ry Age 57:1142 D 18 '14
Double-lever machine for bending bars, il Iron
Age 95:1281 Je 10 '15

Age 95:1281 Je 10 '15 Improved motor-driven pipe-bending machine. il Elec W 65:125 Ja 9 '15

Machine bends six reinforcing bars at a time. il Eng Rec 71:214 F 13 '15

Machine makes intricate pipe bends. il Automobile 32:552-3 Mr 25 15

New hydraulic pipe bending machine. il Iron Age 95:297 F 4'15

30-ton hydraulic pipe bender. il Int Marine Eng 20:278 Je '15

Benzaldehyde

Action of chloral, bromal and benzaldehyde on the polycyclic hydrocarbons in the presence of aluminium chloride. G. B. Frankforter and W. Kritchevsky. Am Chem Soc J 37:385-92 F '15

Researches on hydantoins: stereoisomeric modifications of benzalhydantoin. T. B. Johnson and J. S. Bates. Am Chem Soc J 37:383-5 F '15 Benzalhydantoin

Benzene Freezing point of benzene as a fixed point thermometry. T. W. Richards and J: Shipley. Am Chem Soc J 36:1825-32 S '14

Interpretations of some stereochemical prob-lems in terms of the electronic conception of positive and negative valences, H. S. Fry. Am Chem Soc J 37:855-92 Ap '15

Substitution in the benzene nucleus. A. F Holleman. Am Chem Soc J 36:2495-8 D '14

Benzene, Substitutes for Benzine substitutes for safety lamps. Colliery 35:656 Jl '15

Benzidine hydrochloride

Determination of sulfates in water by benzi-dine hydrochloride. F. W. Bruckmiller. J Ind & Eng Chem 7:600-2 Jl '15

Benzine. See Benzene

Benzoic acid

Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid, and naphthalene. H. C. Dickinson. bibliog U S Tur Stand Bul 11:18 -257 Mr 1 '15 Esterification of benzoic acid by mercaptans. L. S. Pratt and E. E. Reid. diag Am Chem Soc J 37:1934-48 Ag '15 Neutral ammonium salts of some substituted benzoic acids. L. McMaster and I. H. Godlove. Am Chem Soc J 37:2181-8 S '15

Benzol

malysis and valuation of motor fuels—14 methods for examining them; from German data. Automobile 33:202-5, 247-9+ Jl 29-Ag 5

Benzol as a fuel. J Ind & Eng Chem 7:73-4 Benzol

Ja 15 Benzol for gasoline as motor fuel. Sci Am 113:354 O 23 '15 Combustion of benzole in internal combustion engines, E. Terres. Am Soc M E J 37:46-8

Ja '15
Determination of benzol in gas mixtures, G. A.
Burrell and I. W. Robertson, diag J Ind &
Eng Chem 7:669-70 Ag '15; Same, Am Gas
Light J 103:132-3 Ag 30 '15
Determining the benzol in gas. A. Krieger,
diag Am Gas Light J 102:299-300 My 10 '15
Dr. Rittman's gasoline process. Sci Am 112;
248 Mr 13 '15

Dr. Rittman's gasonne process 248 Mr 13 '15 Driving tests with benzol and benzol-alcohol mixtures by Baron Von Loew. Automobile 33:709-11 O 14 '15 Rittman process of cracking. C. H. Claudy. il Sci Am 112:267 Mr 20 '15

Benzophenone chloride
Triphenylmethyl; preparation of ρ-hydroxytriphenylcarbinol and attempts to isolate the corresponding triarylmethyl. M. Gomberg and R. L. Jickling. Am Chem Soc J 37:2575-91 N '15 Benzoyl chloride

Benzoylations in ether solution. W: M. Dehn and A. A. Ball. Am Chem Soc J 36:2091-2101 O '14

Benzoylparatolylhydrazine enzoyiparatoiyinydrazine
Constitution of the hydroxyazo compounds;
the action of unsymmetrical benzoylparatolylhydrazine upon benzoquinene and its
homologs. W: McPherson and G: W. Stratton. Am Chem Soc J 37:906-15 Ap '15

Benzylidene anthranilic acids Action of acetic anhydride on some benzyli-dene anthranilic acids. J: B. Ekeley and C: F. Poe. Am Chem Soc J 37:582-6 Mr '15

Berea college, Berea, Ky. Industrial education in the South, il Bldg Age 37:61-2 O '15

Beriberi-preventing vitamines. W. P. Chamberlain. Sci Am 113:379 O 30 '15 Bermuda

Bermuda's little trees, W. R. Brown, il Am For 21:186-97 Mr '15

Bertillon system
Passing of the Bertillon system of identification, R. B. Fosdick, Sci Am S 803330-1 X
20 715

Bessel functions

Experimental researches on skin effect in conductors. A. E. Kennelly, F. A. Laws and P. H. Pierce, bibliog il diags Am Inst E E Pro 34:1749-1814 Ag '15

Bessemer process
Heat energy from the Bessemer process.
G. Butz. Iron Age 95:618-19 Mr 18 '15

See also Steel metallurgy

Table of bevels. Eng N 73:639 Ap 1 '15

Bible. Old Testament
Medicine of the Old Testament. S. B. Blakely.
Sci Am S 80:70-1, 90 Jl 31-Ag 7 '15

Bicycles

See also Motor cycles

Billerica, Massachusetts

Billerica garden suburb. Eng N 73:815 Ap 29 '15 A. C. Comey, il plan

Bills and notes Notes receivable. S. Walton. J Account 19: 313-17 Ap '15

Bills of exchange, Domestic. See Trade accept-

Binding, See Bookbinding

Bins, Steel Cleveland adopts steel coal and sand storage bins. il diags Elec Ry J 46:1001-2 N 13 '15 Biochemistry. See Biological chemistry

Biological chemistry

Biochemical systems and their function in the development of the organism. W. Bech-terew. Sci Am S 79:131 F 27 '15 See also Barfoed's test

Biology

See also Bacteriology; Cells; Enzymes; Parthenogenesis; Plankton; Variation (biology); Zoology

Biplanes. See Aeroplanes

Use of native woods for interior finish, C. M. Price, il Brickb 24:239-40 O'15

Bird houses Building bird houses. N. Dearborn, diags Am For 21:660-9 My '15 Care of bird houses. N. Dearborn, diags Am For 21:582-5 Ap '15

Bird enemies of forest insects. W. L. McAtee, il Am For 21:681-91 Je '15 Birds and the forests. A. A. Allen. Am For 21:845-6 Ag '15 First national bird census. Sci Am 112:243 Mr 13 '15

Our vanishing shore birds. A. A. Allen. il Am For 21:911-12 S '15 Value of birds to man. Sci Am S 79:356 Je 5

Migration

Departure of the birds, A. A. Allen, il Am For 21:977-80 O '15 Miracle of bird migration, W. W. Cooke, Sci Am 112:476-7 My 22 '15

Birds, Fossil
New light on the great toothed divers of
America. R. W. Shufeldt. il Sci Am S 79:52-3
Ja 23 '15

Birds, Protection of

Brookline protects birds. C: B. Floyd. il Am For 21:792-6 Jl '15 Conserving the waterfowl. A. A. Allen. Am For 21:1047-8 N '15 In defense of our feathered cosmopolites. Sci Am 113:316 O 9 '15

Birkinbine, John, 1844-1915 Sketch, R. W. Raymond, por Am Inst Min E Bul 103:1437-42 Jl '15

Birmingham, Alabama

Railroads

New terminal for the Southern at Birming-ham, il diags Ry Age 59:743-6 O 22 '15

Bituminous materials

Asphaltic materials for road construction. A. A. Berkowitz. Eng & Contr 42:161-3 Ag 12 '14; Same. Munic Eng 47:464-7 D '14

Colloids in relation to manipulation of structural materials. C. Richardson. Munic Eng 48:360-2 Je '15

Determining the melting points of asphalts. J. G. Miller and P. P. Sharples. Eng & Contr 43:87-8 Ja 27 '15

Pavements with pitch filler, il Munic J 38:160-2

Proposed standard terms for bituminous road materials. Eng & Contr 42:234-5 S 2 '14

Purchase of asphalt and asphaltic cement on the bituminous basis. W. H. Broadhurst. Eng & Contr 43:85-6 Ja 27 '15

Bituminous materials -Continued

Specification and selection of asphaltic materials for street pavement, F; O. X. M'Laughlin. Sch Mines Q 36:30-9 N 14

See also Asphalt; Pavements, Bituminous; Roads, Bituminous; Tar

Testing

Cementing value of bituminous binders. L. Kirschbraun. il diags J Ind & Eng Chem 6: 976-85 D '14; Same. Eng & Contr 43:39-43 Ja 13 '15

Bituminous pavements. See Pavements, Bituminous

Bituminous roads, See Roads, Bituminous

Bituminous shales. See Oil shales

Black walnut
Use of native woods for interior finish. C. M.
Price. il Brickb 24:240-1 O '15

Blacksmith shops

New Bessemer & Lake Erie blacksmith shop. il plan Ry Age 58:477-8 Mr 12 '15

Blacksmithing

International railroad master blacksmiths' association 23d annual convention. Ry Age 59:387-9 Ag 27 '15 International railroad master blacksmiths' convention. Ry Age (Mech ed) 89:471-81 S

See also Forging; Welding

Blankets

Origin of blankets. Textile World 49:352-3 Je

Blast furnace gas

Blast furnace gas
Blast-furnace gas for coke ovens, O. Simmersbach, Ind Eng 15:29-30 Ja '15; Same, Iron
Age 95:242-3 Ja 28 '15; Same, Am Gas Light
J 102:135+ Mr 1 '15
Burning blast furnace gas; Bradshaw-Huessener combustion arrangement, diags Iron
Age 95:612-13 Mr 18 '15
Carburisation of iron at low temperatures in
blast furnace gases; abstracts, with discussion, T. H. Byrom, Engineer 120:335 O 8
'15; Iron Age 96:1176-8 N 18 '15
Gas from blast furnaces, its cleaning and utilization, J. E. Johnson, jr. diags Met & Chem
Eng 12:685-92, 760-9 N-D '14; Same, Sci Am
S 19:03-5, 110-12, 126-7, 112-3 F 6-27 '15
Hot-blast stove gas burners, il diags Iron Age
96:356-7 Ag 12 '15
Large blast furnace gas engines, H. Hubert,
il diags Engineer 119:511-14, 524-5 My 21-28
'15

Utilization of blast furnace gas. A. N. Diehl. Iron Tr R 57:946-8, 993-7, 1040-2 N 11-25 '15; Abstract. Iron Tr R 57:853-6 O 28 '15; Abstract, with discussion. Iron Age 96:988-90 Abst. stract, v

Utilization of waste heat for the generation of electrical energy, H, Hobson. Inst E E J 53:846 Je 15 '15

Blast furnace stoves

Brown hot blast stove, diags Iron Tr R 57:

179 Jl 22 '15

Massha practice,

own 179 Jl 22 blast 179 Jl 22 '15
High blast heats in Mesaba practice.
W. Mathesius. Am Inst Min E Bul 99:539-55
Mr '15; Same cond. Iron Age 95:475-8 F 25
'15; Same cond. Iron Tr R 56:365-6, 368 F 18
'15; Abstract, Met & Chem Eng 13:177-8 Mr
'15; Discussion. Am Inst Min E Bul 101:
1100-7 My '15
Hot-blast stove gas burners il diogr. Iron Age

1100-7 My '15

Hot-blast stove gas burners, il diags Iron Age 96:356-7 Ag 12 '15

Hot stove with 3-in, checker walls, diags Iron Age 96:133 Jl 15 '15

New process for accelerated heating, A. Spannagel, Iron Age 94:1318-19 D 3 '14

New process for heating blast-furnace stoves, Eng & Min J 99:240 Ja 30 '15

New type of brick for hot-blast stoves, diag Iron Age 96:312-13 Ag 5 '15

Progress in blast furnace practice; results of an efficiency test on hot blast stoves, A. E. Maccoun, diags Iron Tr R 56:1320-8

Je 24 '15; Abstract, Iron Age 96:625-6 S 16 '15

Blast furnaces

Blast-furnace plant auxiliaries and general arrangement. J. E. Johnson, jr. diags Met & Chem Eng 13:373-8, 429-39, 495-9 Je-Ag

Blast-furnace practice, Iron Age 95:406-7 F 18

'15
Blast furnace scaffolds, il Iron Age 94:1446 D
24 '14
Blast furnace slag handling system, F. L.
Frentiss, il Iron Age 95:1396-8 Je 24 '15
Blast-furnace spout at Great Falls, Mont.
diag Eng & Min J 99:741 Ap 24 '15
Blast furnace tapping machine, il Iron Tr R
57:321-3 Ag 12 '15
Blast furnace vs. reverberatory. Eng & Min

57:321-3 Ag 12 '15 Blast furnace vs. reverberatory. Eng & Min J 99:832-3 My 8 '15

J 99:832-3 My 8 '15
Blast furnace work, Iron Age 95:102-3 Ja 7 '15
Bosh fuel domes, F: L: Grammer, diag Eng
Soc W Pa 31:609-20 O '15
Bosh of lead furnaces, L. D. Anderson, Eng &
Min J 98:1045-6 D 12 '14
Briquettes in blast-furnace practice, M. Zillgen, Iron Age 94:1394-5 D 17 '14
Castings from blast furnace, Iron Age 96:1054

Chemical principles of the blast furnace. J. E. Johnson, Jr. Met & Chem Eng 13:536-43, 634-8 S 1-15 '15

Chemical principles of the blast furnace. J. E. Johnson, Jr. Met & Chem Eng 13:536-43, 634-8 S 1-15 '15

Efficiency of the blast furnace operation. B. F. Eurman. Met & Chem Eng 13:624-9 S '15

Furnace improvements at plant of Jackson iron & steel co., Jackson, O. il diags Iron Tr R 56:724-7 Ap 8 '15

Furnace operation at Mt. Lyell. Eng & Min J 99:1034-5 Je 12 '15

Gas blowing engines at the Steelton plant of the Pennsylvania steel company. il Met & Chem Eng 13:516-19 Ag '15

Gas blowing engines for the Pennsylvania steel co. il Iron Age 96:12-14 Jl 1 '15

Gas blowing engines for the Pennsylvania steel co. il Iron Tr R 57:33-5+ Jl 1 '15

Handling iron and cinder at the blast furnace. J. E. Johnson, jr. il diags Met & Chem Eng 13:43-50, N5-9 Jn-F '15

Heat balance of the blast furnace. S. Cornell. Met & Chem Eng 12:747-50 D '14

High blast heats in Mesaba practice. W. Mathesius. Am Inst Min E Bul 99:539-55

Mr '15; Same cond. Iron Tr R 56:365-6, 368 F 18 '15; Abstract. Met & Chem Eng 13:177-8

Mr '15: Discussion. Am Inst Min E Bul 101:1100-7 My '15

History of a bad furnace cast. W. G. Imhoff. Iron Tr R 57:131-2 Jl 15 '15

Measurement of the temperature drop in blast-furnace hot-blast mains. R. J. Wysor. diag Am Inst Min E Bul 106:2161-70 O '15; Abstract. Iron Age 96:869 O 14 '15

Operation of spiegeleisen blast furnaces. H. Thaler. Iron Age 94:1398-9 D 17 '14

Oxygen blast for the iron blast furnace. J. E. Johnson, jr. Met & Chem Eng 13:483-4 Ag

Oxygen blast for the iron blast furnace. J. E. Johnson, jr. Met & Chem Eng 13:483-4 Ag

Progress in blast furnace practice. A. E. Mac-coun. Iron Tr R 56:1129-31, 1167-9, 1255-64, 1320-8 Je 3-24 '15; Abstract. Iron Age 96: 624-6 S 16 '15

Progress in blast furnace practice. A. N. Diehl. Iron Tr R 57:28-9, 31 Jl 1 '15

Progress in the smelting of Mayari ore. R: V. M'Kay, Iron Age 93:1386-9+ Je 4 '14; Same. Iron Tr R 55:1215-21 D 31 '14

Raw coal in blast furnaces. Iron Age 96:525 S

Rebuilding furnace at low cost at Colebrook plant of Lackawanna iron & steel co. H. C. Estep. il plans Iron Tr R 56:514-16+ Mr 11

Southern Ohio blast furnace modernized. il diag Iron Age 95:738-40 Ap 1 '15

Tapping shield at Anaconda. il Eng & Min J 99:494 Mr 13 '15

Thermal principles of the blast furnace. J. I Johnson, jr. Met & Chem Eng 13:718-2 787-92, 833-40, 905-10, 954-62 O 15-D 15 '15

Titaniferous ores in the blast furnace. F. Bachman. Iron Age 94:1470-1; Discuss A. H. Lee; R. H. Lee. 94:1471-3 D 24 '14 Discussion.

Trend of modern blast furnace construction.

A. E. Maccoun, diags Eng Soc W Pa 30: 935-58 Ja '15; Abstract, Iron Tr R 56:175+
Ja 21 '15; Discussion, Eng Soc W Pa 30: 958-72 Ja '15

Turbo-blower for the blast furnace; abstract. F. G. Cutler, Ind Eng 14:439-40 N '14

Blast furnaces -Continued

last furnaces —Continued
Turbo blowers for blast-furnace blowing, R: H.
Rice, il diags Am Inst Min E Bul 89:721-43
My '14; Abstract, Am Soe M E J 36:0151-2
Ji '14; Discussion, Am Inst Min E Bul 100:
794-809 Ap '15
Wet ores in charcoal blast furnaces, R. H.
Lee, Met & Chem Eng 13:882 D 1 '15

See also Blast furnace gas; Blast furnace stoves; Cast iron; Coke ovens; Cupola furnaces; Iron metallurgy; Slag; Slag settlers Blast furnace

## Charging

Blast-furnace charging apparatus. F. C. Roberts. diags Iron Age 95:234-5 Ja 28 '15
Blast-furnace skips and transfer cars; an English installation of the eighteenth century.
F. C. Roberts, il diag Iron Age 95:192-3 Ja 21 '15

Charge car at Midvale, Utah. il Eng & Min J 100:519-20 S 25 '15 Filling the blast furnace. J. E. Johnson, jr. il diags Met & Chem Eng 13:161-73, 227-33 Mr-Ap '15
Telpher furnace charging, N. Kapp. diags Iron
Age 94:1388-9 D 17 '14

Blast lamps

Blast lamp for natural gas. H. C. Chapin, il J Ind & Eng Chem 7:46-7 Ja '15

Blast stoves. See Blast furnace stoves

Blasting
Ditch digging by blasting. F. W. Wilson. il
Eng & Contr 44:150 Ag 25 '15
Electric shot firing in Kansas. C. B. Carpenter. diag Colliery 35:596-8 Je '15
Electric shot firing in Oklahoma. Colliery 35:408-9 Mr '15

Elizabele cut Eng & Min J 99:1083 Je 19 '15 Electric shot firing in Oklaholat.

408-9 Mr '15
Five-hole cut. Eng & Min J 99:1083 Je 19 '15
Five-hole cut. H. A. Morrison, diags Eng &
Min J 99:956 My 29 '15
Hints on loading drill holes. Eng & Min J
100:761 N 6 '15
How electric blasting saves. Eng & Min J 100:
802 N 13 '15
Largest blast on record, il map Eng N 73:10267 My 27 '15
Mother Lode blast, F. S. Norcross, jr. il Eng

Largest blast on record, il map Eng N 73:1020-7 My 27 '15
Mother Lode blast, F. S. Norcross, jr. il Eng & Min J 99:931-5 My 29 '15; Abstract, Eng M 49:920-3 S '15
New electric blasting caps for wet work. Eng & Min J 100:311 Ag 21 '15
New safety detonating fuse: Cordeau detonant.
H. Souder, il diags Am Inst Min E Bul 94: 2547-56 O '14; Abstract, Eng M 48:416-18 D '14; Abstract, Eng & Contr 42:462-3 N 11 '14; Discussion, Am Inst Min E Bul 100: 895-902 Ap '15

'14; Discussion. Am Inst Min E Bul 100: \$95-902 Ap '15

Pointers to avoid trouble with blasting fuse. Eng Rec 72:178 Ag 7 '15

Primer on explosives for metal miners and quarrymen. C: E. Munroe and C. Hall. diags pls U S Bur Mines Bul 80:1-117 '15

Rock work in coal mines, il diags Colliery 35: 237-40 D '14

Safety methods used in handling explosives

237-40 D '14
Safety methods used in handling explosives, il Eng N 73:1080-1 Je 3 '15
Shot-firing in coal mines by electric circuit from the surface. G: S. Rice and H. H. Clark. Am Inst Min E Bul 94:2563-71 O '14; Discussion. 160:885-91 Ap '15
Use and abuse of fuse. Eng & Min J 100: 882-3 N 27 '15

Blasting, Substitutes for. See Hydraulic mining cartridge

Bleaching

Bleaching and finishing crepes. Textile World 49:121-2 Ap '15 Bleaching artificial silk. Textile World 48:506 F

Bleaching knit goods. Textile World 48:409 Ja

Bleaching of cotton and linen mixed goods. Textile World 49:551-2 Ag '15 Blue spots on knit goods. Textile World 48:507 F '15

Improved bleaching process. Textile World 49: 682-4 S '15

682-4 S '15 Improved high pressure boiling jigger, il diag Textile World 48:427-8 Ja '15 Improved process of bleaching. Textile World 50:229-30 N '15

Kambara earth and its bleaching action on oils. S. Ueno. diags J Ind & Eng Chem 7: 596-600 Jl '15

Kuehn bleaching apparatus for cotton. diag Textile World 48:623-4 Mr '15 Thies system of bleaching piece 'goods. diag Textile World 48:620-1 Mr '15

See also Cleaning; Dyes and dyeing

See also Optophone; Phonopticon

Printing and writing systems

Printing for the blind, Sci Am S 79:247 Ap

Block signals. See Railroads-Signals

Blockade

Blockade by submarine. Sci Am 112:376 Ap 24 '15

Blood

hinhydrin reaction in relation to the age and habits of individuals. J. Takamine, jr. Am Chem Soc J 37:946-9 Ap '15

Analysis

Nephelometric estimation of purine bases, including uric acid, in urine and blood, S. S. Graves and P. A. Kober. Am Chem Soc J 37:2430-47 O '15

Blooming mills. See Rolling mills

Bloomington, Indiana

Sewerage

Sewage disposal at Bloomington; abstract. U. S. Hanna. Munic J 37:883-4 D 17 '14

Blotters

Printers' blotters. Inland Ptr 55:784a-784h S

Blower systems

Blower systems
Blower systems for heating and ventilating and stock and refuse conveying systems: committee report. A. M. Feldman, diags Am Soc Heat & V E 20:412-20 '14
Four-prong fork for pipe of blower system, diags Metal Work 83:811-12+ Je 4 '15
Removing acid fumes by blower system method. W. E. Piper, diag Metal Work 84: 682-3 N 26 '15
Theory and practice in warm-air heating, diags Metal Work 84:451-3 O 8 '15

Blowers

Advantages and disadvantages of various types of blowers for cupola work. Am Soc M E J 37:227-8 Ap '15 Blades of two blowers break. W: A. Dunkley. il Power 42:694 N 16 '15 Choosing air compressors for activated-sludge tanks. C. H. Nordell. Eng N 74:904-6 N 4 '15 Efficiency of the blast furnace operation. B. F. Burman. Met & Chem Eng 13:624-9 S 15 '15

Forced draft. Colliery 35:502-3, 559-60 Ap-My

Forced draft. Colliery 35:502-3, 559-60 Ap-My '15
Gas blowing engines at the Steelton plant of the Pennsylvania steel company. il Met & Chem Eng 13:516-19 Ag '15
Gas blowing engines for the Pennsylvania steel co. il Iron Age 96:12-14 Jl 1 '15
Gas blowing engines for the Pennsylvania steel co. il Iron Tr R 57:33-5+ Jl 1 '15
High-speed blowers and compressors. il Iron Age 96:136-7 Jl 15 '15
Methods and facilities for specifying and testing blowers also measuring air and steam supply to the water gas generators. J. M Spitzglass. Am Gas Inst Pro 9:pt 1, 615-66; Discussion. 9:pt 1, 666-77 '14
Modern gas-power blower stations. A. West. il diags Am Inst Min E Bul 102:1205-13 Je '15; Abstract. Am Soc M E J 37:413 Jl '15; Abstract. Am Soc M E J 37:413 Jl '15; Now Schlotter blower. A. Gradenwitz. il Power 41:261-2 F '23 '15
Notes on fans. A. A. Potter and S. L. Simmering. Power 41:816 Je 15 '15
Remote control of gas blower. W. A. Dunkley. diag Power 42:558 O 19 '15
Soot blowers as adapted for use on economiz-

Soot blowers as adapted for use on economizers, diag Power 42:194-5 Ag 10 '15

Tests of hand and mechanical soot blowers. A. W. Conklin. diag Power 42:48-50 Jl 13 '15 Turbo-blower for the blast furnace: abstract. F. G. Cutler. Ind Eng 14:439-40 N '14

Turbo-blower governing devices; abstract.
A. Stodola. diags Am Soc M E J 37:181-2
Mr '15

Blowers-Continued

lowers—Continued
Turbo-blowers and turbo-compressors. O. H.
Wunderlich. Power 42:280 Ag 24 '15
Turbo blowers for blast-furnace blowing. R: H.
Rice. il diags Am Inst Min E Bul 89:721-43
My '14; Abstract. Am Soc M E J 36:0151-2
Jl '14; Discussion. Am Inst Min E Bul 100:
794-809 Ap '15

See also Blast furnaces

Blowoff tanks

Blowoff tanks
Blow-off tanks
Blow-off tank and its connections, J. Graham.
diags Dom Eng 72:223 Ag 21 '15
Concrete blowoff basin, A. D. Williams, diags
Power 41:373-4 Mr 16 '15
How the blow-off water from boilers may
be cooled before discharge into sewer, T. W.
Reynolds, plan Elec W 66:592 S 11 '15

Blownine

Quantitative blowpiping as an aid to the pros-pector. S. Fischer, jr. diags Met & Chem Eng 12:693-5, 771-5 N-D '14

Blueprinting machinery
Blueprint drying and ironing machine. il Iron
Age 95:443-4 F 25 '15
New continuous blueprinting machine. il diag
Iron Age 95:614 Mr 18 '15
Swinging blueprint frame is cheap and efficient. F: W. Salmon. diag Eng Rec 72:100-1
J1 24 '15

Blueprints

Bueprints
Efficient use for surplus blueprints. F. H.
Jones. Eng Rec 70:672-3 D 19 '14
Efficient use of surplus blueprints. L. R. W.
Allison. Eng Rec 71:88 Ja 16 '15
How to make blueprints from opaque originals.
Eng & Min J 100:309 Ag 21 '15

Board of mediation and conciliation. See United States—Board of mediation and conciliation Boards of health. See Health boards

Boards of trade. See Chambers of commerce

Drill boat lifts itself out of the water to escape waves. W. B. Macdonald. il diags Eng Rec 71:756 Je 12 '15

Scc also Barges; Dredges; Flying boats; Hydroplanes; Lifeboats; Motor boats; Scows; Ships; Submarine boats; Torpedo boats; Towboats; Yachts

Boiler accidents

Oller accidents
Gas explosions in boiler furnaces. diags
Power 41:553-4, 651-3, 719, 785-6 Ap 20, My
11, 25, Je 8 '15
Gas explosions in boilers. R. Trautschold.
Power 42:650-2 N 9 '15
Gas explosions in lignite fired boiler plants;
abstract. P. M. Grempe. Am Soc M E J 37:
233 Ap '15
Increases in safety of boiler operation in Prus-

Increase in safety of boiler operation in Prussia; abstract. B. Hilliger. Am Soc M E J 37: 608-9 O '15; Same. Power 42:773 N 30 '15

See also Boiler explosions

Boiler cleaning

oner cleaning
American railway master mechanics' association; report of the committee on boiler
washing, Ry R 56:851-3 Je 19 '15
Boiler washing and filling system for small
roundhouses. W: Wells, plan Ry Age

Boiler wasning and filling system for small roundhouses. W: Wells. plan Ry Age (Mech ed) 89:251-2 My '15
Clean boilers and tight joints another source of economy. Old Scotch. Int Marine Eng 19: 561 D '14

561 D '14
Core sand in the heating system. Locomotive 30:110-12 O '14
Economy of coal and boiler corrosion. G. J. Meyers. Int Marine Eng 20:175-6 Ap '15
Graphite in boilers. W. Weaver. Power 41:131-2
Ja 26 '15
Results with mechanical soot blowers on

Ja 26 '15
Results with mechanical soot blowers on boilers. A. J. Fisher. Power 42:314 Ag 31 '15
Schutte & Koerting soot conveyor. diag Power 41:876 Je 29 '15
Soot blowers as adapted for use on economizers. diag Power 42:194-5 Ag 10 '15

Tests of hand and mechanical soot blowers. A. W. Conklin. diag Power 42:48-50 Jl 13 '15 Vulcan vertical water-tube diags Power 42:223 Ag 17 '15 boiler cleaner.

Y-fitting for washing out boilers. P: E. M Intosh, il Ry Age (Mech ed) 89:530 O'15

Boiler corrosion. See Boilers-Corrosion

Boiler explosions

Accident to a boiler fired with producer gas.

Am Soc M E J 37:116 F '15

Boiler accidents in France in 1912. Am Soc

M E J 37:410-11 JI '15

Boiler explosion at Menlo, Iowa. S. Kirlin. il

Power 41:382 Mr 16 '15

Boiler explosion in milling plant, Columbus,

Kan. J. R. Hamilton. il Power 42:276-7 Ag

24 '15

Boiler explosions. Elec W 66:80 Jl 10 '15 Boiler explosions. See quarterly number numbers of the Locomotive

Boiler explosions. See quarterly numbers of the Locomotive
Boiler explosions during first half of 1914. Power 41:140-4 Ja 26 '15
Boiler explosions during second half of 1914; table. Power 42:63-6 Jl 13 '15
Boiler explosions in Great Britain. Locomotive 30:120-2 O '14
Boiler failures and what the American society of mechanical engineers is doing to prevent them. E. R. Fish. Assn Eng Soc J 55:12-18 Jl '15; Same. Am Soc M E J 37:509-11 S '15
Confirmation of the Colburn-Clark theory of boiler explosions. il Locomotive 30:162-4 Ap '15; Same. Power 42:357-8 S 7 '15
Explosion of a locomobile boiler; abstract. Miller. diag Am Soc M E J 37:233-4 Ap '15
Explosion of steam drum of B. & W. boiler at Shamokin, Penn. il Power 42:733 N 23 '15
Hazard of the domestic hot water boiler. il Locomotive 30:142-5 Ja '15
Steam-boiler explosions. W: H. Boebm. il Colliery 36:23-6 Ag '15
Two years of boiler-explosion reports. Power 42:57 Jl 13 '15
Unprecedented accident to a torpedo-boat destroyer: the Aylwin. il Sci Am 112:71 Ja 16 '15
Year's boiler explosions: annual report of the

Tyear's boiler explosions; annual report of the marine department of the Board of trade for the year ending June 30, 1914. Power 41:524-5 Ap 13 '15 See also Boiler accidents

Boiler feeding. See Feed water Boiler heads

Convex and concave drum heads. D. Hogan. Power 41:450 Mr 30 '15 Formulas for bumped heads. Power 41:202 F

Stresses in convex heads. F. F. Couch. diags Power 42:675-7 N 16 '15

Stresses in convex heads. F. G. Gasche. Power 41:59 Ja 12 '15

Stresses in convex heads. Power 40:817-18 D 8 '14 H. J. Vander Eb. Boiler inspection

A. S. M. E. code. Iron Age 96:28-9 Jl 1 '15 Boiler inspection on private railroads in Rus-sia; abstract. B. B. Sooshinski. Am Soc M E J 37:720-1 D '15 Facts about inspecting boilers. J. Francis. Ry Age (Mech ed) 89:365-6 Jl '15

Age (Mech ed) 89:305-6 J1 15 Federal government boiler inspection report. Ry Age 57:1196-7 D 25 '14 Hartford inspection service during 1914. Lo-comotive 30:177-9 Ap '15 Model boiler-inspection and engineers' license law. Power 42:82-3 J1 20 '15

inspection method. il diags Locomotive 98-102 O'14 30:98-102 O

Report of the chief inspector of locomotive boilers. F. McManamy. Ry R 56:19-20 Ja 2

esults of the locomotive boiler inspection law. F. McManamy. Ry Age 58:621-2 Mr 19 '15; Same cond. Ry Age (Mech ed) 89:190-1 Ap '15; Same cond. Power 41:898-900 Je 29

Steam-boiler construction and inspection, H. A. Baumhart. Power 39:900-1 Je 23 '14; Abstract. Eng & Contr 42:178-9 Ag 19 '14

Visits of inspector Brown. J. E. Power 42:86-7, 154-5 Jl 20, Ag 3 '15 Boiler joints. See Boilers—Joints

Boiler law. See Boilers-Laws and regulations Boiler makers' association, Master. See Master boiler makers' association

Boiler plants
Air intakes increase furnace capacity, diags
Elec Ry J 46:641-2 S 25 '15

Boiler plants—Continued

Boiler plant of the Bessemer coal and coke company; using as fuel a mixture of coal and slate. W. O. Rogers. il diags plan Power 41:798-801 Je 15 '15

Boiler plant of Union brewery, St. Louis.
T: Wilson. il plans Power 41:662-5 My 18

Boiler-room practices in Europe and this country; abstract with discussion. W: A. Blonck, diags Elec W 65:481-2 F 20 '15 Cost of steam. C. W. Howard. Power 41:273 F 23 '15

Cost of steam. H. L. Strong. Power 41:133 Ja

Cost of steam. H. L. Strong. Power 41:133 Ja 26 '15 Economical boiler-house design. R. D. De-Wolf. Eng M 49:837-42 S '15 Experience in an isolated plant. E: T. Binns. Power 41:686 My 18 '15 Gas burners in 2750-hp. office-building boiler plant. il diag Power 42:79-80 Jl 20 '15 How to increase steam production. H. R. Callaway. Eng M 49:833-9 S '15 Increased the capacity of the plant. B. M. Babcock. Power 41:685-6 My 18 '15 Keeping track of plant operation at the Cleveland municipal plant. A. D. Williams. il Power 41:292-4 Mr 2 '15 Lights in the boiler room. J. C. Hawkins. plan Power 42:591 O 26 '15 Reconstructing existing plants. O. Monnett. diags Power 40:920-2 D 29 '14 Steam costs in 6600-hp. boiler plant. F. G. Philo. Power 41:368-9 Mr 16 '15 Steam-generating methods, Cleveland municipal plant. A. D. Williams. il Power 41: 631-3 My 11 '15 Warren state hospital power plant. W. O. Rogers. il diags Power 42:364-5, 408-12 S 14-21 '15 Washington avenue power plant, Scranton, Penn W. O. Rogers il diag Power 41:868-

Washington avenue power plant, Scranton, Penn. W. O. Rogers, il diag Power 41:868-76 Je 29 '15

See also Boilers; Steam plants

Boiler plates
Brittleness of wrought iron as a consequence
of heating compressed material; abstract.
R: Baumann. diag Am Soc M E J 37:605-6
O '15

Convenient form of plate caliper. Locomotive 30:169-70 Ap '15

30:169-70 Ap '15
Tests on the diagonal strength of boiler plate.
J. W. F. Macdonald. Power 41:779-80 Je 8 Thick boiler plates, S. F. Jeter, diags Power 40:884-5 D 22 '14

40:884-5

Thick boiler plates. T: Grimes. Power 40:133 Ja 26 '15 Tom Hunter, hoisting engineer. W. O. Rogers. il diag Power 42:678-80 N 16 '15

Boiler scale Boiler corrosion and scale to be ended by the use of electricity. Sci Am S 80:272 O 23 '15 Mechanical scale preventer, il Power 40:835 D

15 '14 Prevention of boiler scale and corrosion. A. H. Babcock. Elec W 65:114 Ja 9 '15

Boiler setting. See Boilers-Setting

Boiler tubes

Boiler tubes have tendency to spring upward.
J. C. Hawkins, diag Power 42:452 S 28 '15
Deformation of boiler tubes, T; R Tarn, diag
Power 42:656-7 N 9 '15
Electric process for safe-ending tubes. L. R.
Pomeroy, diags Ry Age (Mech ed) 89:469-70

Flue welding. E. J. Haskins. Ry Age (Meched) 89:471 S '15 Pikal system of boiler tube replacement; abstract. diags Am Soc M E J 37:480-1 Ag '15

Repairing locomotive boiler tubes. N. H. Ahsi-uolh. il plans Ry Age (Mech ed) 89:83-5 F '15

Retubing tubular and water-tube boilers. J. C. Hawkins. diags Power 41:330-2 Mr 9 '15 Specifications for lap-welded and seamless boil-

er tubes. Iron Age 94:1418-19 D 17 '14 Using old boiler tubes as pipe. J. P. Nolan. il diag Ry Age (Mech ed) 89:192 Ap '15

Visits of isits of inspector Brown, J. E. Terman. Power 42:648-9 N 9 '15 Specifications

Boiler tube specifications, diags Iron Tr R 57: 47-8 Jl 1 '15

Boilers

American society of mechanical engineers: discussion of the boiler report, Am Soc M E J 37:41-3 Ja '15; Elec W 65:114-15 Ja 9 '15 Boiler capacity for steam curing. Concrete Cem 7:185-6 N '15 Boiler-control boards at Delray, N. G. Reinbecker, il Power 42:435-6 S 28 '15 Boiler practice of 1915. A. D. Pratt. diag Elec W 66:690-1 S 25 '15 Boiler for isolated plants, C: L. Hubbard, Power 41:232-4 F 16 '15 Cleaning fires under boilers, diags Elec W 65: 734-5 Mr 20 '15 Corrugated furnaces for vertical fire-tube boilers, F. W. Dean, diag Power 42:103 Jl 20 '15

Defender boiler-room appliances. il Power 41:

609 My 4 '15
Draft in furnaces and flues. E. G. Bailey, diags Power 42:638-42 N 9 '15
Economizing zinc. H. de B. Parsons, Sci Am S 80:224 O 2 '15

80:224 O 2 '15
Eddy rings in firetube boilers. Am Soc M E J
37:117 F '15
Feeding graphite to boilers. C. N. Wiley.
diags Power 41:616-17 My 4 '15
Gas fired boilers. Herr Birkholz. Am Gas Light
J 102:99-101 F 15 '15
German progress in steam boiler firing;
abstract. Pradel. Am Soc M E J 37:235-6 Ap
'15

'15
Hand firing soft coal under power-plant boilers. H: Kreisinger, diags U S Bur Mines Tech Pa 80:1-77 '15; Abstract. Am Gas Light J 102:139-40 Mr 1 '15
Increasing boiler capacity. J. Harrington, diags Power 41:739-40 Je 1 '15
Influence of altitude on boilers. J. D. Skinner. Power 42:248-9 Ag 17 '15
Lagging furnace walls to stop heat loss. Elec W 65:1049-50 Ap 24 '15
Multiple-unit boiler control. E. F. Fisher, diags Power 42:378-80 S 14 '15
Newport boilers. il Metal Work 84:257 Ag 20 '15

Nine-foot return-tubular boiler, il Power 41: 431-2 Mr 30 '15
Performance of a cinder catcher, M. Van Valkenburgh and M. H. Isenberg, plan Power 40: 918-19 D 29 '14
Poor circulation in boilers, diag Int Marine Eng 20:318-19 Jl '15
Problems in burning powdered coal. A. S. Mann, il diags Gen Elec R 18:959-65 O '15
Pulverized coal for steam making, F. R. Low, diags Power 40:35-8 Jl 7 '14; Same, Am Soc M E J 36:346-52 O '14; Same cond, Ind Eng 14:333-6 Ag '14; Abstract, Colliery 35:530-2 My '15

My '15 Recording power plant operations. J. C. Smallwood. il diags Eng M 50:33-46 O '15 Relation between quality of steam and load on the boiler in the case of a Cornish boiler; abstract. Am Soc M E J 37:185 Mr '15 Results of changes in boiler furnace. M. B. Smith. diag Power 41:92-3 Ja 19 '15 Return-tubular boiler furnace development. O. Monnett. diags Power 40:93-4 Jl 21 '14; Same. Sci Am S 78:394-5 D 19 '14 Reverberatory waste-heat boilers. L. Duncan. il diag Eng & Min J 99:152-3 Ja 16 '15 Similar features of boiler and refrigeration systems. T: G. Thurston. Power 42:437-8 S 28 '15

28 '15
Steam-boiler construction and inspection.
H. A. Baumhart. Power 39:900-1 Je 23 '14;
Abstract. Eng & Contr 42:178-9 Ag 19 '14
Steam boiler economy in factories. W: Kent.
Ind Eng 15:22 Ja '15
Steam boiler of 1915. A. D. Pratt. diags
Power 42:661-7 N 9 '15
Study of draft in boilers. C. F. Hirshfeld.
diags Power 42:196-7 Ag 10 '15
Unaccounted-for loss. S. U. Tuspin. Elec W
65:1306-7 My 22 '15
Unc. of corrugated furneses for vertical fire

Use of corrugated furnaces for vertical fire tube boilers; with discussion. F. W. Dean. diag Am Soc M E J 37:445-6 Ag '15

Valve 'requirements of boilers. T. W. Reynolds. plans Elec W 66:976-8 O 30 '15

Boilers-Continued

oilers—Continued
Washing and laying up boilers. J. E. Noble.
Power 42:451-2 S 28 '15
Washing and laying up boilers for the summer. J. C. Hawkins. Power 42:277 Ag 24 '15
Waste-heat boilers. O. Monnett, diags Power
41:196-7 F 9 '15; Same. Eng & Min J 99:3689 F 20 '15
Waste-heat boilers at Chrome, N. J. C. L.
Brower, il diags Eng & Min J 99:892-5 My
22 '15

22 '15 Waste-heat boilers in steel plants; abstracts. C. J. Bacon. diags Iron Age 95:1349-52 Je 17 '15; Iron Tr R 56:1123-4 Je 3 '15; Power 42:27-8 Jl 6 '15 Why's of boiler draft. C. F. Hirshfeld. diags Power 41:675-9 My 18 '15

See also Blowoff tanks; Boiler cleaning; Boiler explosions; Boiler inspection; Boiler plants; Feed water; Firing; Fuel economy; Furnaces; Grates; Locomotive boilers; Safety valves; Steam engines; Stokers, Mechanical; Water gages

## Corrosion

Corrosion

Boiler corrosion and scale to be ended by the use of electricity. Sci Am S 80:272 O 23 '15

Economy of coal and boiler corrosion. G. J. Meyers. Int Marine Eng 20:175-6 Ap '15. Interesting case of boiler corrosion. F. Kilian. diag Int Marine Eng 19:564-5 D '14

Notes on boiler operation. C. E. Stromeyer. Power 42:628-9 N 2 '15

Preventing corrosion from electrolytic action. Power 41:740 Je 1'15

Unexploded boiler. A: Suzara. il Int Marine Eng 20:273-4 Je '15

#### Electric heating

High-voltage alternating-current boilers. il Elec W 65:430-1 F 13 '15

## Feeding

See Feed water

Heads See Boiler heads

# Joints

Ratio of circumferential to longitudinal stresses in boiler joints. J. K. Linderhurst. Power 41:611-12 My 4 '15 Strength of diagonal joints. J. E. Terman. diags Power 41:296-7 Mr 2 '15

## Laws and regulations

Laws and regulations

A. S. M. E. boiler code. Locomotive 30: 175-7 Ap '15

A. S. M. E. boiler code approved by council. Power 41:268-70 F 23 '15

A. S. M. E. code. Iron Age 96:28-9 JI 1 '15

Boiler code of the A. S. M. E. R. C. Carpenter. Sibley J 29:179-83 Mr '15

Boiler industry needs uniformity. Iron Tr R. 56:1301 Je 24 '15

Digest of boiler laws of states of the United States. Power 42:sup JI 27 '15

Lack of synchronism in check-valve action. S. F. Jeter. diags Power 41:48 Ja 12 '15

Massachusetts board of boiler rules hearing. Power 42:702 N 16 '15

Model boiler and engineers' license law—references. Power 42:166-8 Ag 3 '15

Model boiler-inspection and engineers' license law. Fower 42:82-3 JI 20 '15

Progress on the report of the boiler committee of the Am. Soc. M. E. J. Am Soc. M. E. J. Spromulgation of the boiler code by the Ameri-

Promulgation of the boiler code by the American uniform boiler law society. Am Soc M E J 37:xix-xx D '15

Safety first in the power plant. Power 40:813-

Standard boiler code approved. Elec Ry J 45: 377-8 F 20 '15

Steam-boiler law proposed by the Mechanical engineers' committee. Eng N 72:1178-9 D 10

## Rating

Archaic boiler horsepower. Power 41:167-8 F '15

Heating surface a measure of steaming ability. Elec W 65:939 Ap 10 '15

Limiting factors in forcing boilers aborating. T. Maynz. diag Power 42:609-12 2 '15

2 15 Rational units for the boiler room. H. G. Stott. Elec Ry J 45:468 Mr 6 '15 Table of boiler heating surface and horse-power, Locomotive 30:118-20 O '14

## Repair

How a water-tube boiler was repaired by an electric weld. A. C. Lasher, Elec W 66:1207-8 N 27 '15

8 N 27 '15
Repairing flame bridges i: B. & W. boilers.
R. A. Brownell. diags Power 42:20 Jl 6 '15
Repairs to a Babcock and Wilcox boiler. F. H.
Sadler, diag Int Marine Eng 20:319-20 Jl '15
Retubing tubular and water-tube boilers. J. C.
Hawkins. diags Power 41:330-2 Mr 9 '15
Visits of inspector Brown. J. E. Terman. diag
Power 42:440-1, 580-2 S 28, O 26 '15

## Safety devices and measures

Safety devices and measures

Calculation of dimensions of safety valves with high lift; abstract. Otte. Am Soc M E J 37:481 Ag '15

In case of emergency; water-sealed exit. E. H. Peabody. il Power 42:605-6 N 2 '15

Investigation of fusible tin boiler plugs. G: K. Burgess and P. D. Merica. il U S Bur Stand Tech Pa 53:1-37 '15; Same cond. J Ind & Eng Chem 7:824-9 O '15; Abstracts. Iron Age 95:1403-4 Je 24 '15; Am Gas Light J 103:28-9 Jl 12 '15; Am Soc M E J 37:654 N '15; Power 42:733-4 N 23 '15

Investigation of fusible tin boiler plugs. G. K. Burgess and P. D. Merica. Metal Ind n s 13: 321 Ag '15; Same. Elec W 66:303-4 Ag 7 '15; Same. Power 42:190-1 Ag 10 '15; Same. Met & Chem Eng 13:568 S 1 '15

Notes on boiler oberation. C. E. Stromeyer. Power 42:628-9 N 2 '15

Plea for automatic stop valves. Power 42:57-8 Jl 13 '15

Sentinel low-water alarm. il Ry R 56:854 Je 19 '15

Sudden cooling of boilers in cases of low water. R. N. Blackburn. Power 42:696-8 N 16 '15

## Settina

Firebrick for boiler settings. W: A. Heisel. Power 41:883-7 Je 29 '15 Flanner boiler setting. diag Power 42:7 Jl 6 '15 Hanger brackets for horizontal return-tubular boilers. O. C. Woolson. Power 42:520-1 O

Headroom for smokeless settings. O. Monnett.
Power 40:885-6 D 22 '14
Inexpensive way of stopping leaks in boiler
settings. J. R. Cravath, Elec W 66:1029-30
N 6 '15

N 6 '15

New setting for Worthington boiler, diag Power 40:860-1 D 15 '14

Reconstructing existing plants. O. Monnett, diags Power 40:920-2 D 29 '14

Reconstructing water-tube boiler settings. O. Monnett, diags Power 41:54-5 Ja 12 '15

Settings for horizontal tubular boiler furnaces. H. R. Wass. Power 42:557 O 19 '15

Special reconstruction jobs. O. Monnett, diags Power 41:91-2 Ja 19 '15

Supporting horizontal return-tubular boilers, A. A. Adler, diag Power 42:130 Jl 27 '15

Supporting horizontal return-tubular boilers. F. W. Dean, diags Power 41:848; 42:309-10 Je 22, Ag 31 '15

## Specifications

Boiler failures and what the American society of mechanical engineers is doing to prevent them. E. R. Fish. Assn Eng Soc J 55; 12-18 JI '15; Same. Am Soc M E J 37:509-11 S '15

Boiler steel specifications. Iron Age 95:592 Mr 11 '15

Air excess in boiler furnace practice, D. F. Nisbet. Sibley J 29:122-8 Ja '15
Boiler efficiency kit. il Power 41:84 Ja 19 '15
Boiler tests at various loads. C: M. Rogers. Power 42:75 Jl 20 '15
Boiler tests at various loads. H: O'Neill. Power 42:556-7 O 19 '15
Boiler tests at various loads. T. Maynz. Power 42:240 Ag 17 '15

Boilers—Testing—Continued
Boiler tests at various loads, V; J. Azbe,
Power 42:421 S 21 '15
Comparative tests of stoker- and hand-fired
boilers, H. S. Knowlton, il Power 41:300-1
Mr 2 '15

Power plant of the government printing of-fice. D. H. Tuck. Power 41:578-9 Ap 27 '15 Power plant testing. W. M. Selvey. diags Inst E E J 53:110-13; Discussion. 53:118-45 Ja 1 '15

Practical man's boiler test. Power 41:168 F 2

Problems of furnace and boiler economy. A. L. Wescott. diag chart Elee W 66:583-6 S 11 '15 Simplifying reports of boiler tests, W: Kent; H. D. Fisher. Power 40:852-4 D 15 '14 Study of boiler losses. A. P. Kratz. il diags III U Eng Exp Sta Bul 78:1-72 '15; Abstract. Am Soc M E. J. 37:491 Ag '15; Excerpts. Power 42:766-9 N 30 '15 Superheat in vertical fire-tube boilers. S. P. Stewart. Power 42:582-6 O 26 '15 Test of down-draft sectional boiler. C. A. Fuller. Metal Work 83:282-3 F 19 '15; Same. Dom Eng 71:64-5 Ap 17 '15 Test of the radial stays between the combustion chamber and the shell of a marine type boiler. diags Locomotive 30:102-10 O '14

Testing the largest cast-iron boiler in the world, il diags Metal Work 83:388-9 Mr 12 '15 Tests on a recent type of chain grate stoker and new method of baffling Stirling boilers. J: A. Hunter, diags Eng Soc W Pa 31:1-10; Discussion. 31:10-55 F '15; Abstract. Am Soc M E J 27:248-51 Je '15 Utilization of blast furnace gas. A. N. Diehl, Iron Tr R 57:1040-2+ N 25 '15 Utilization of blast furnace gas. A. N. Diehl, Iron Tr R 57:1040-2+ N 25 '15 Waste of inspector Brown, J. E. Terman, Power 42:710-11 N 23 '15 Warren state hospital power plant, W. O. Rogers. Power 42:411-12 S 21 '15 Washington avenue power plant, Scranton, Penn, W. O. Rogers. Power 41:872 Je 29 '15 Wood and coal as fuel for steam boilers. H. B. Reynolds, tables Sibley J 30:14-20 O '15 Sec also Flue gas

See also Flue gas

Boilers, Heating

Boiler ratings and chimney sizes. E: R. Pierce.
Dom Eng 69:301-2 D 5 '14
Briquets as fuel for house heating boilers.
D. T. Randall. il Metal Work 83:847-9 Je 11

Heating boiler and the master workman. C. S. Dow. Metal Work 83:261-2 F 12 '15 How boiler and greenhouse parts are molded.

E. C. K 57 Jl '15 Kreutzberg, il plan Foundry

McLain gas boilers for steam and hot water heating, il Dom Eng 73:214 N 13 '15 New magazine feed boiler, il Heat & Ven

heating. il Dom Eng 73:214 N 13 '15
New magazine feed boiler. il Heat & Ven 12:46-8 Jl '15
Rules for construction of heating boilers. Dom Eng 71:215-17 My 22 '15
Selection of boilers for heating plants. A. F. Lowndes. Metal Work 83:131-4 Ja 15 '15
Smoke abatement in house heating boilers. M. A. Rooney. il Heat & Ven 12:17-20 O '15
Space requirements for boilers of various types in school buildings. T. W. Reynolds. diags Heat & Ven 12:17-19 Jl '15
Test of cast-iron downdraft boiler. C. A. Fuller. Dom Eng 71:64-5 Ap 17 '15; Same. Metal Work 83:282-3 F 19 '15
Testing house heating boilers and checking manufacturers' ratings. I. N. Evans. Heat & Ven 12:50-1 Je '15
Testing the largest cast-iron boiler in the world. il diags Metal Work 83:388-9 Mr 12 '15
Thermal tests of heating boilers at the Institute of thermal research, Buffalo, New York. il Am Soc Heat & V E 20:220-6 '14
Uniform method for testing house heating boilers: report of committee. Am Soc Heat & V E 20:197-203 '14; Same. Metal Work 82: 739-40 D 4 '14; Discussion. Am Soc Heat & V E 20:203-9 '14
Unsteady water line in heating boilers. Heat

Unsteady water line in heating boilers. Heat & Ven 12:60 Ag '15

Boilers, Hot water Hazard of the domestic hot water boiler, il Locomotive 30:142-5 Ja '15

Boilers, Locomotive. See Locomotive boilers

Boilers, Marine
Dry back marine boiler, with tubes between furnace and combustion chamber. A. C. Meyers. plan Int Marine Eng 20:511-12 N '15; Abstract. Am Soc M E J 37:720 D '15 Economy. F. H. Sadler. diags Int Marine Eng 20:460-2 O '15

20:460-2 O '15
Experiments in coal consumption. Int Marine Eng 20:41-2 Ja '15
Faulty designing of marine boilers. C. R. Williamson. Int Marine Eng 20:134-6 Mr '15
How the efficiency of the Scotch boiler can be improved; abstract. J: Tait. Int Marine Eng 20:89-90 F '15
Interesting case of boiler corrosion. F. Kilian. diag Int Marine Eng 19:564-5 D '14
Lovekin marine boiler and internal superheater. A. B. Willits. diags Power 42:293-5
Ag 31 '15
Repairs to a Babcock and Wilcox boiler. F. H.

Ag 31 '15
Repairs to a Babcock and Wilcox boiler. F. H. Sadler. diag Int Marine Eng 20:319-20 JI '15
Test of the radial stays between the combustion chamber and the shell of a marine type boiler. diags Locomotive 30:102-10 O '14
Unexploded boiler. A: Suzara. il Int Marine Eng 20:273-4 Je '15

See also Marine engineering: Marine en-

Boilers, Mercury
Power from mercury vapor. W. L. R. Emmet.
il diags Am Inst E E Pro 33:473-89 Mr '14;
Same. Gen Elec R 17:47-51, 99-103 Ja-F '14;
Same cond. Power 39:449-50 Mr 31 '14; Same cond. Eng M 47:265-8 My '14; Same cond. Engineer 117:697-8 Je 26 '14; Excerpts. Sci
Am 112:494-5 My 29 '15

Boilers, Water-tube
Draft readings on a Stirling boiler. S. H. Viall.
diags Power 41:44-5 Ja 12 '15
How a water-tube boiler was repaired by an
electric weld. A. C. Lasher, Elec W 66:12078 N 27 '15

electric weld. A. C. Lasher. Elec W 66:1207-8 N 27 '15
Improved Badenhausen water-tube boiler. diag
Power 40:883-4 D 22 '14
Putting new headers in water-tube boilers.
R. T. Gray. Power 41:649-50 My 11 '15
Reconstructing water-tube boiler settings. O.
Monnett. diags Power 41:54-5 Ja 12 '15
Rectangular pressure vessels. H. J. Vander
Eb. Locomotive 30:164-9 Ap '15
Repairs to a Babcock and Wilcox boiler. F. H.
Sadler, diag Int Marine Eng 20:319-20 JI '15
Test of a 30-h.p. class A Stirling boiler.
Power 42:674 N 16 '15
Tests on a recent type of chain grate stoker
and new method of baffling Stirling boilers.
J: A. Hunter. diags Eng Soc W Pa 31:1-10;
Discussion. 31:10-55 F '15; Abstract. Am Soc
M E J 37:348-51 Je '15
Winslow high-pressure boiler. il diags Power
40:824-6 D 8 '14

Boiling points

Advantageous form of still for the exact measurement of boiling point during frac-tional distillation. T. W. Richards and F: Barry. il Am Chem Soc J 36:1787-91 Ag

Boiling-point of aqueous solutions of nitric acid at different pressures. H: J. M. Creigh-ton and J: H. Githens. diag J Fr Inst 179: 161-9 F '15

Bolivia

Financial developments in South American countries. W: H. Lough, U S Bur For & Dom Com 103:16-18 '15

## Industries and resources

Industries and resources
Corocoro copper district of Bolivia. F. A. Sundt.
Eng & Min J 99:189-90 Ja 23 '15
Gold mining in Bolivia. F. C. Lincoln. il Eng & Min J 99:351-4 F 20 '15
Hydro-electric plant at Bolivian tin mine.
M. R. Lamb. il Eng & Min J 99:7-9 Ja 2 '15
Mining in Bolivia. H. L. Venables. Eng & Min J 99:662 Ap 10 '15
Tin mining in Bolivia. M. G. F. Soehnlein. Eng & Min J 99:43-5 Ja 16 '15
Tin mining in Bolivia. M. R. Lamb. Eng & Min J 99:605-6 Ap 3 '15
Tin-ore dressing at Llallagua. Bolivia D. Copeland and S. E. Hollister. il Eng & Min J 100:421-4 S 13 '15
Trip through Bolivia. S. C. Bullock. il Eng & Min J 100:421-4 S 11 '15

Bolts and nuts
Ballou safety bolt nut for rail joints, il Ry
Age 59:751-2 O 22 '15

Age 59:751-2 O 22 '15
Bolt and nut making. D. T. Hamilton. il Mach 21:383-5 Ja '15
Description of nut, bolt and rivet shop of Upson nut co., Cleveland, with details of arrangement and equipment. R. V. Sawhill. il plan Iron Tr R 56:1245-54+ Je 17 '15
Foundation bolts for steel chimneys. H. D. Hess. diags Power 42:476 O 5 '15; Same. Eng & Min J 100:718-19 O 30 '15
Holding power of a bolt. E. H. Fish. il Power 41:619-20 My 4 '15
Installing rolling-mill anchor bolts. A. Connley. diags Iron Age 96:296-7 Ag 5 '15
National automatic nut tapper. il Mach 21:515-17 F '15

National automatic nut tapper, il Mach 21:315-17 F '15
National bolt header, il Mach 21:833-4 Je '15
National continuous motion hammer bolt heading machine, il Ry Age (Mech ed) 89:373-4 Jl
'15; Iron Age 95:1217 Je 3 '15; Iron Tr R
57:265 Ag 5 '15
New forge shop of Upson nut company, Cleveland, il plans Iron Age 95:1336-43 Je 17 '15
Proposed standard specification for quenched
carbon steel track bolts. Ry Age 59:62-3 Jl
9 '15; Same, Iron Tr R 57:43-4 Jl 1 '15
Reclaiming bolts with battered threads, J. P.
Nolan, il Ry Age (Mech ed) 89:39-40 Ja '15
Removable wedge bolt, H. E. Oplinger, diags
Ry Age (Mech ed) 89:591 N '15
Spacing of bolts for wrench clearance, L; J.
Schroeder, Mach 21:982 Ag '15
Turning engine bolts, C. L. Dickert, il diags
Ry Age (Mech ed) 89:193-4 Ap '15
Soncs

Annuities and bond discount. O: A. Spies. J Account 20:203-15 S '15 Annuities and bond discount. R. J. Bennett. J Account 20:1-20 Jl '15 Bonus capital stock and bonds. W: P. Hilton. J Account 19:425-36 Je '15 Calculating premiums on bonds. Munic J 38:

426 Ap 1 '15 Highway bonds: a compilation of data and an analysis of economic features affecting construction and maintenance of highways financed by bond issues, and the theory of highway bond calculations. L. I. Hewes and J. W. Glover, il maps U S Agric Bul 136:1-129, 15 and J. V 136:1-129

ife of highway improvement should limit term of bonds. N. P. Lewis. Eng Rec 72:352 S 18 '15

Road bonds should provide for maintenance. J. F. Witt. Eng Rec 72:352-3 S 18 '15 Tyranny of the engraver. A. S. Little. J Account 20:186-202 S '15

See also Railroads-Securities; Securities

Bonds, Rail. See Rail bonds

Bone-black. See Animal charcoal

Bonington, Richard Parkes, 1801-1828 Architectural draughtsmen. H:
Am Inst Arch J 3:159-67 Ap '15 Winslow, il

Bonsail, Amos

Relics from the second Grinnell expedition. Sci Am S 79:300 My 8 '15

Bonus system

Bonus system of comprehensive scope, Worcester, Mass. J: Nelson. Iron Age 95:65-8 Ja 7

Compensation of meter readers, H. P. Schaper, Am Gas Inst Pro 9:pt 2, 1683-7 '14; Same, Am Gas Light J 101:333 N 23 '14; Same, Eng & Contr 42:558-9 D 16 '14; Discussion, Am Gas Inst Pro 9:pt 2, 1687-1707 '14

Criminal speeding-up system—and some facts. W: Crozier. Am Ind 15:30-1 Ja '15

Fixing standard time for a bonus system.

Z. L. Potter. Ry Age (Mech ed) 89:192-3

Ap '15

Management anagement of central stations. W. N. Polakov. Eng M 50:371-2 D '15

Manila plant employees receive bonus for increasing coal economy. Elec W 66:694 S 25

Modified bonus method of wage payment. C: W. Mixter. Iron Age 94:1384-5 D 17 '14

Operating a foundry on a scientific basis. F: A. Parkhurst. il Foundry 43:53-8 F'15

Piece work and bonus systems in the boiler shop. N. H. Ahsiuolh. Ry Age (Mech ed) 89:240-2 My '15 must represent the bonus system. J. R. McFarland. Eng N 74:405-6 Ag 26 '15; Same. Eng & Min J 100:517-18 S 25 '15 Task and bonus work applied to excavation. Concrete Cem 5:243 D '14 Taylorism and the bonus system. W. L. Myles. Mach 21:404-5 Ja '15 Wage systems of scientific management. Ind Eng 15:47-50 F '15

Bookbinding Scientific management in the office. R. T. Kent. Iron Age 95:82-6, 142-4 Ja 7-14 '15

Cost

Bookbinding labor-cost. A, H. Hughmark. Inland Ptr 55:805-8 S '15

Bookbinding machinery
Foreign trade in bookbinders' machinery.
Engineer 119:400-1 Ap 23 '15

Bookkeeping Society bookkeeping; standardized method for recording and checking the accounts. Metal Ind n s 13:233-5 Je '15

See also Accounting; Auditing; Cost accounting

Books and reading

Books of 1914: statistics from Publishers' weekly, Sci Am 112:287 Mr 27 '15 Light reading for polar explorers. Sci Am 112: 262 Mr 20 '15

See also Bookbinding; Printing

Booth, Franklin

Franklin Booth, artist—an appreciation. S. H. Horgan, il Inland Ptr 54:506-7 Ja '15

Blacksmith's use of borax and cyanide. Eng & Min J 99:1076 Je 19 '15 Current status of the borax industry. S: H. Dolbear, Met & Chem Eng 13:564 S I '15

Borers (animals)

Burrowing animals; borers that wend their way even through rock. P. Collins. il Sei Am 113:99+Jl 31 '15

Destruction of timber by marine borers. E. S. Christian. Ry Age 58:162-3 Ja 22 '15

Marine wood borers: little known crustaceans of destructive habits. C. H. Truesdale. il Sci Am S 78:356-7 D 5 '14

Boric acid

Using volcanic steam for the production of electrical energy, il Sci Am 112:97-8 Ja 30 '15 Boring (earth and rocks). See Drilling and boring (earth and rocks)

Boring (metal working, etc.). See Drilling and boring (metal working, etc.)

Boron

Determination of boron in iron. J. M. 1 gren. Am Chem Soc J 37:1137-9 My '15

Effect of boron upon the magnetic and other properties of electrolytic iron melted in vacuo. T. D. Yensen. il III U Eng Exp Sta Bul 77:1-19 '15

Boron nitride Fixation of atmospheric nitrogen. Sci Am S 79:388 Je 19 '15

Bose, Jagadis Chandra, 1858-Scientific work of Prof. J. C. Bose. J. Kunz. Sci Am S 79:291 My 8 '15

Boston, Massachusetts
Boston proposes to extend eastward into bay.
map Eng Rec 71:642 My 22 '15

Architecture

Annex to the city hall, Boston, Mass. il plans Arch & Bldg 47:265-7 Jl '15 Architectural reclamation of small areas in cities. H. D. Eberlein. il Arch Rec 37:1-25 Ja

Boston city club, Somerset street; views and plans. Brickb 24:77, pl 31-6 Mr '15

Bridges

Apportionment of cost of highway bridges between street railways and cities; with discussion. C: M. Spofford. il diags W Soc E J 20:405-43 My '15

Boston, Massachusetts—Bridges—Continued
Design and construction of the Larz Anderson
bridge over the Charles river, Cambridge
and Boston, Mass. il plans Eng & Contr
42:334-8 O 7 '14

## Custom house

Electrical features of Boston custom house tower, il Elec R & W Elec'n 67:336-7 Ag 21 '15

#### Harbor

Development of port of Boston, map Eng & Contr 43:sup29 Je 16 '15

## Lighting

Boston street-lighting contract signed. Elec W 64:1185 D 19 '14

## Parks

Aquarium and winter house for birds for the city of Boston, W: D. Austin, il plans Brickb 24:47-50 F '15

#### Rapid transit

Another Massachusetts fare Elec Ry J 46:226-8 Ag 7'15 increase, man

Massachusetts commission reports to the legislature on transportation in metropoli-tan Boston. Elec Ry J 45:809-10 Ap 24 '15

Station entrances on Boston subways. W. B. Conant. il Munic Eng 49:13-14 Jl '15

## Soil formations

Boston foundations. J. R. Worcester. 26 fold maps Boston Soc C E J 1:1-29 Ja '14; Dis-cussion. 1:179-248, 395-417 Ap, S '14

#### Streets

\$3,000,000 needed for improving Boston's streets. Eng Rec 72:503-4 O 23 '15

## Water supply

Chelsea creek tunnel for Boston water main. W. B. Comant, il dings Munic J 38:387-10 Mr 25 '15

Boston & Albany railroad Boston & Albany railroad improvements at Worcester, Mass. L. G. Morphy, il Boston Soc C E J 1:481-98 N '14

Boston & Maine railroad

Abstract of annual report. map Ry Age 59: 679-80 O 15 '15

Federal valuation of the Boston and Maine railroad. F. C. Shepherd. Boston Soc C E J 2:291-326 O '15; Same abr. Eng Rec 72: 538-41 O 30 '15; Same abr. Ry R 57:665-7 N

Track elevation at Lynn, Mass. C: B. Breed. il diags plans Eng N 74:533-7 S 16 '15

Boston elevated railway Statement of income, profit and loss for the fiscal year ended June 30, 1915. Elec Ry J 46:1008-9 N 13 '15

Boston Post road

Surfacing the Boston Post road, il Munic J 39:547-8 O 7 '15

Boston society of civil engineers
Duties and sphere of action of a local engineering society with special reference to the Boston society of civil engineers. H. P. Eddy. Boston Soc C E J 2:149-63 Ap '15

Proceedings. Boston Soc C E J 2:1\*-39\* Ap

Bottles

Bottle filling alarm. E. J. Hall. il Met & Chem Eng 13:347 Je '15; Same. Sci Am S 80:284 O 30 '15

Boulder batholith

bulder batholith and its bearing upon the future of mining in the district. J. A. Grimes. Eng & Min J 100:794 N 13 '15
Boulder batholith of Montana. P. Billingsley. diags maps Am Inst Min E Bul 97:31-47 Ja '15; Discussion. 101:1128-37 My '15

Is the Boulder batholith a laccolith? discussion of paper by A. C. Lawson, A. Knopf, Econ Geol 9:396-402 Je '14

Boulder county, Colorado Mining in Boulder county. Eng & Min J 100: 797-8 N 13 '15

Boulders

Boulder parapet for roadways in Palisades interstate park, il Eng N 74:162-3 Jl 22 '15

Bowman, Austin Lord, 1861-1915

Sketch, por Eng N 73:1141 Je 10 '15; Eng Rec 71:758 Je 12 '15

Box cars. See Freight cars

Boxes

See also Cardboard

Boy scouts

Boy scouts and forests. K. W. Woodward. il Am For 21:103-9 F '15

Boycott

Danbury hatters decision. Am Ind 15:7-10 F '15 Famous Danbury hatters' case decided in fa-vor of the boycotted employer. Iron Tr R 56: 143-5 Ja 14 '15

Brake beams

Brake beams; Master car builders' association committee report. Ry R 56:834-5 Je 19 '15 Car control. J. Fitzmorris. Ry Age (Mech ed) 89:71-2 F '15

Safety hanger for brake beams, diags Ry Age 59:291 Ag 13 '15

Brake rigging

rake rigging
Berdan brake rigging. diags Ry Age (Meched) 89:483 S '15
Inexpensive slack take-up for brake rigging.
il Elec Ry J 46:921 O 30 '15
Manual slack adjuster. diags Ry Age 59:948
N 19 '15

Tests of standard and clasp brake rigging for

passenger train service; abstract. Lickey. Am Soc M E J 37:724-5 D '15

Brake shafts

Brake shaft drop handle and ratchet, diags Ry Age (Mech ed) 83:43 Ja '15 Improved brake shaft arrangement, Buffalo, Rochester & Pittsburgh Ry, diag Ry R 56: 320-1 Mr 6 '15 Square brake shaft, diags Ry Age (Mech ed) 88:647-8 D '14

Brake shoes

Brake shoe with malleable iron inserts. diag Ry Age 59:168 Jl 23 '15 Driver brake shoes. J. S. Sheafe. Ry Age 58: 616 Mr 19 '15

Alternating-current coal hoist. R. E. Brown. il Am Inst E E Pro 34:615-22 Ap '15; Dis-cussion. 34:2895-914 N '15

cussion, 34:2895-914 N '15
Alternating-current magnetic brake, il Elec
R & W Elec'n 67:301 Ag 14 '15; Iron Age
96:414 Ag 19 '15; Iron Tr R 57:265 Ag 5 '15;
Mach 21:1024-5 Ag '15
Automatic solenoid brake for crane, hoist, liftbridge and similar service, il Elec R & W
Elec'n 65:1230-1 D 26 '14; Mach 21:328-9 D il Elec

Dynamic braking. Elec R & W Elec'n 66:300-1

Freight car hand brake. diags Ry Age 58:944 Ap 30 '15; Same. Ry Age (Mech ed) 89:258-9 My '15

Hand-brake pressures. L. W. Horne. diags Elec Ry J 46:67-8 Jl 10 '15 Hand-brake pressures. W: C. Greenough. diags Elec Ry J 46:276-7 Ag 14 '15

Hand brakes outlawed. Ry Age 58:1018-19 My 14'15

More notes on regenerative braking. Elec Ry J 45:1101 Je 12 '15

uick action lever hand brake, il Ry Age 59:398-9 Ag 27 '15

Railway vehicle brakes, diag Engineer 119:67 Ja 15'15

Regenerative braking, Engineer 119:458 My 7

Regenerative braking, F. J. Sprague, Elec Ry J 45:1076-7 Je 5 '15

Train brake and signal equipment; Master car builders' association committee report. R 56:832-3 Je 19 '15

See also Air brakes

Brakes, Automobile Evolution of hub brakes, diags Horseless Age 36:23-4 Jl 7 '15

Brakes, Automobile—Continued
Three broad classes of brakes. A. L. Clayden, diags Automobile 32:452-5 Mr 11 '15 20,000,000 feet of brake lining. Automobile 32:509 Mr 18 '15

Brashear, John A., 1840-President of the Am. Soc. M. E. W: L. Scaife. por Eng N 73:389 F 25 '15

Brass

Annealing brass for forming and drawing operations, H. W. Dunbar, il Mach 21:560-1

operations. H. W. Dunbar. il Mach 21:560-1 Mr '15
Annealing of brass. F. Johnson. il Metal Ind n s 13:65-7 F '15
Annealing of brass cartridge cases. L. J. Krom. il diags Metal Ind n s 13:359-63 S '15
Applications of metallic cobalt: experiments conducted with cobalt and copper alloys. D. B. Browne. Metal Ind n s 12:509-10 D '14
Brass and bronze—offsprings of copper. J. E: Schipper. il map Automobile 33:315-19, 368-70, 412-13 Ag 19-S 2 '15
Brass finishing and coloring. A. A. Le Fort. Metal Ind n s 13:144 Ap '15
Brass in water works construction with special reference to experience on the Catskill aqueduct: abstracts. A. D. Flinn. Eng & Contr 43:57-8 Ja 20 '15: Metal Ind n s 12:500-2 D '14; Munic J 37:922-4 D 24 '14
Failure of structural brasses. P. D. Merica and R. W. Woodward. Metal Ind n s 13:459-61 N '15 (to be cont)
Heat treatment of copper and brass. C. R. Hayward. il Metal Ind n s 13:275-7 Jl '15
Rich gold color on brass. Metal Ind n s 13:239
Je '15
Vanadium in brass. R. J. Dunn and O. F.

Vanadium in brass, R. J. Dunn and O. F. Hudson. Metal Ind n s 13:330 Ag '15 Why brass is an expensive luxury in the en-gine room. Old Scotch. Int Marine Eng 20:

See also Brass founding; Tubes

Brass founders' ague
Note on review of Dr. Thompson's Occupational diseases. J. W. Luther. J Ind & Eng
Chem 7:451-2 My '15

Brass founding
Copper alloys with notes on brass founding
H. L. Reason, diags Metal Ind n s 13:318-21
Ag '15

Ag '15
Developments in electric brass furnace melting: new type to utilize the pinch effect. G. H. Clamer and C. Hering, il diag Foundry 42:487-90 D '14; Same cond. Iron Age 94:1492-5 D 31 '14; Abstract: Ind Eng 15:56-7 F '15
Difficulties with yellow brass trap covers, il Foundry 43:29-30 Ja '15
Drop-pouring process of casting: the solution of a difficult brass foundry problem. E. A. Barnes, il Metal Ind n s 12:511-12 D '14
Making brass castings with emergency equipment. J: Leafstrom, diag Foundry 43:232 Je '15

Mushroom gates and risers. Foundry 43:69 F

Practical suggestions for the brass foundry. R. Micks. Metal Ind n s 13:99 Mr '15 Reclaiming brass sweepings. A. W. Lemme. Iron Age 95:946 Ap 29 '15; Same. Foundry 43:191-2 My '15; Same. Metal Ind n s 13: 187-8 My '15

Tests of natural gas-fired brass furnaces. F. L. Wolf and R. B. Burr. diags Foundry 43:153-7 Ap '15
Top-pouring brass liners. J. L. Sendner. diag Foundry 43:231-2 Je '15
Trolley wheel difficulties. Foundry 43:315 Ag

se of electricity in melting brass. H. G. Dorsey, il diag from Tr R 57:319-20+ Ag 12 45

Brass foundries

Brass foundry equipment and management.
W. H. Parry. Metal Ind n s 13:5-6, 61, 186,
452 Ja-F, My, N '15
Brass foundry profits. W. H. Parry. Metal Ind
n s 13:364 S '15
Brass goods manufacturing plant. P. W. Blair.
il Metal Ind n s 13:269-73 Jl '15
Cost keeping in the brass foundry. C. O.
Skeeper. Metal Ind n s 12:497-9 D '14

Efficiency in the brass foundry. W. R. Dean. Metal Ind n s 13:327-9 Ag '15

Efficient methods of the Yale & Towne mfg. co. and details of its specially-equipped shop. H. C. Estep. Il plans Foundry 43:129-37 Ap '15; Same (Castings for locks and hardware). Iron Tr R 56:809-16+ Ap 22 '15 Team work in a brass plant. P. W. Blair. Foundry 43:279-80 Jl '15

See also Brass founding

Brass plating
Control of brass and copper plating solutions.
A. D. Cowperthwait. Metal Ind n s 13:68-9

Brauneria angustifolia Constituents of the root of brauneria angusti-folia. F: W. Heyl and M. C. Hart. Am Chem Soc J 37:1769-78 Jl '15

razil
Banking and credit in Argentina, Brazil,
Chile, and Peru. E: N. Hurley. U S Bur For
& Dom Com 90:1-72 '14
Financial developments in South American
countries. W: H. Lough, U S Bur For &
Dom Com 103:19-28 '15
Roosevelt-Rondon scientific expedition. L. E.
Miller, il Sci Am S 79:248-9, 268-70 Ap 17-24
'15

## Commerce

America and Brazil in the war crisis, M. Summers, Metal Work 82:762 D 11 '14 Electrical markets in Brazil. H. N. Douthitt. Elec W 65:1488-9, 1598 Je 5, 19 '15

#### Industries and resources

Coal fields of South America. W. G. Burroughs. Colliery 36:72-3 S '15
Electrical opportunities in Brazil. H. N. Douthitt. Elec W 66:156-7 Jl 17 '15
Iron industry in Brazil. E. C. Harder. il maps Am Inst Min E Pul 94:2573-86 O '14: Same cond. Iron Tr R 55:718-20+ O 15 '14: Same cond. Metal Work 84:143-5+ Jl 30 '15; Abstract. Iron Age 94:888-9 O 15 '14; Discussion. Am Inst Min E Bul 100:813-16 Ap '15 See also Electric industries-Brazil

Brazing outfit for narrow band saws. F. W. Barrows. il diag Foundry 43:317-18 Ag '15 Brazing stellite to machine steel. Mach 21:421

Ja '15 Gas brazing furnace, diags Ry Age (Mech ed) 89:591-2 N '15 Soldering and brazing aluminum. Mach 21:286-

8 D

Bread

Better bread by means of natural lactic acid. A. Wahl. J Ind & Eng Chem 7:773-5 S '15 Determination of sulfates in bread. C: D. Howard. J Ind & Eng Chem 7:807 S '15 See also Bakers and bakeries; Flour

Breakage Cost of breakage and leakage. S. Walton. J Account 19:149-52 F '15

Breakwaters

Chicago breakwater extensions. diags Eng N 74:740-1 O 14 '15
Concrete cribs used successfully in dock construction at Victoria. il diags plans Eng Rec 72:165-7 Ag 7 '15
Dumping-bridge for building an embankment in tidal water. il Eng N 73:634-5 Ap 1 '15
Rubble mound breakwater and pierhead to be constructed at Conneaut Harbor, O. diag Eng & Contr 44:sup29 JI 21 '15
Toronto breakwater to curb 10-foot waves diags Eng Rec 70:694-6 D 26 '14

## Breeding

See also Hybridization; Plant breeding

Brethren of the workshop of Vitruvius First architectural society in America, R. W Haddon, Arch Rec 38:287-8 Ag '15

Breweries
Boiler plant of Union brewery, St. Louis
T: Wilson. il plans Power 41:662-5 My 1 Louis

Electricity in breweries. il Elec R & W Elec'ı 66:1143-6 Je 19 '15

Contributions of the chemist to the brewing industry. G. D. Thevenot. J Ind & Eng Chem 7:285-7 Ap '15

Brewing -Continued

Starch-forming enzyme from malt; its action on the hemicelluloses and its commercial application to brewing. C: B. Davis, il J Ind & Eng Chem 7:115-18 F '15

Brick, See Bricks

Brick construction

Estimating the cost of mill buildings. C: F. Dingman. Eng & Contr 44:185 S 8 '15 Large brick piers tested at laboratory of Bureau of standards; abstracts. J. H. Griffith and J. G. Bragg. il Eng Rec 71:460-1 Ap 10 '15; Eng N 74:242-3 Ag 5 '15; Ind Eng 15: 106 S '15

See also Bricklaying; Pavements, Brick

Brick handling

Cost of loading bricks into a box car by means of a portable belt conveyor. A. C. Haskell, diag Eng & Contr 44:204 S 15 '15 Handling bricks with gravity roller conveyors, W. B. Conant. il Eng N 74:834-5 O

ors. V Moving brick by wheelbarrow. W. B. Conant. il Eng N 74:701 O 7 '15

Brick-making. See Brickmaking

Brick pavements. See Pavements. Brick

Bricklaying

ricklaying
British method of laying bricks. Bldg Age 37:
67-8 F '15
Industrial education in the South: the course
in bricklaying and plastering as taught in
the Hampton institute trade school. il Bldg
Age 37:67-9 Ja '15
Saving money in the laying of brick. il Bldg
Age 37:46-8 Ja '15; Same cond. Eng Rec 71;
90 Ja 16 '15

Cost

Smeltery brick-laying costs, Eng & Min J 100:109 J1 17 '15

Brickmaking

Brickmaking
Brick-plant production increased by electric drive, il Elec W 65:794 Mr 27 '15
Electrically operated brick factory at Springfield, Ill. il Elec W 65:671-3 Mr 13 '15
Electricity in brick-making, il Elec R & W Elec'n 66:65-9 Ja 9 '15
Making brick without clay, Ry Age 58:468 Mr 12 '15; Sci Am 112:351 Ap 10 '15
Motor applications of the brick manufacturing industry, T. Z. Simpers, Am Inst E E Pro 34:3023-8 D '15
Motors show saving in replacing gasoline en-

Motors show saving in replacing gasoline engines in brickyard, il Elec W 66:258 Jl 31 '15 New building material invented by A. Malinovszky, il Munic Eng 48:186-92 Mr '15

Checker design for open hearths. W. A. Janssen. Iron Tr R 57:624-5 S 30 '15
Diatom heat-insulating brick. Met & Chem
Eng 13:129 F '15 Diatom heat Eng 13:129

Standard prices for furnace brick. Iron Tr R 55:1185-6 D 24 '14 What are porous bricks? Bldg Age 37:60 J1 '15

See also Brick construction; Bricklaying; Brickmaking; Clay; Fire brick; Pavements, Brick; Tiles

## Testing

Favorable tests of Elmira brick. Eng Rec 70: 649 D 12  $^{\circ}14$  Rattler test for paving brick abandoned in St. Louis, M. Schuyler, Eng Rec 72:200-1 Ag 14

Spherical bearings versus flat plates in crushing tests on bricks. E. L. Baker and A. F. Suss. diags Assn Eng Soc J 55:122-8 O '15

Bricks, Concrete. See Concrete bricks

Bricks, Glass. See Glass bricks

Bridge abutments. See Bridges-Abutments

Bridge approaches

ridge approaches
Concrete chuting plant with braced boom and chute. E. L. Jones. il Eng N 73:193-4 F 4 '15
Design features of the approaches of the North side Point bridge, Pittsburgh, Pa. diags Eng & Contr 42:196-8 Ag 26 '14
Highway bridge approach details. F. Barber. il Eng N 73:961-3 My 20 '15
Plant and working methods on approaches to North side Point bridge. E. L. Jones. il diag Eng N 72:1124-6 D 3 '14

Slip of approach embankment damages concrete bridge, Herkimer, N. Y. A. T. Clark, il Eng N 74:771 O 21 '15

Bridge contracts

ridge contracts
Instructions of the Pennsylvania state highway commissioner to bridge companies. Eng
& Contr 43:79 Ja 27 '15
Sizing-up and bidding on a contract in dull
times. diag Eng N 73:682-3 Ap 8 '15

Bridge design

Allowing for impact in bridge calculations. J. D. W. Ball. diags Engineer 120:151-3 Ag J. D. 15

J. D. W. Ball. diags Engineer 120:151-3 Ag 13'15
Bridge for Holland government railway in Java. il diags Ry R 57:404-5 S 25'15
Center bearing, machinery and gates, Congress St. swingbridge, Troy, N. Y. diags plan Eng N 73:804-5 Ap 29'15
Chesapeake & Ohio Northern railway bridge over the Ohio river at Sciotoville, O. diags Eng & Contr 44:84-5 Ag 4'15
Concrete arch bridge at Saskatoon. il diags Eng N 73:434-6 Mr 4'15
Concrete viaduct of a new type; eastern viaduct, New York Connecting R. R. il diags Eng N 73:886-7 My 6'15
Cost of railway footbridges, diags Engineer 120:197-9, 221-3, 240-2, 266-8 Ag 27-S 17'15
Design and construction of a reinforced concrete truss bridge with braced counterfort abutments near Merthyr, Wales, C: E. Holloway, diags Eng & Contr 44:390-2 N 17'15
Design and construction of the Main street reinforced concrete viaduct at Fort Worth, Tex. S. W. Bowen, diags Eng & Contr 43: 211-16 Mr 10'15
Design and construction of the San Jacinto street reinforced concrete bridge, Houston, Texas, il diags Eng & Contr 42:492-5 N 25'14
Design and construction of the substructure

Design and construction of the substructure of the Buffalo river lift bridge, Buffalo, N. Y. il diags Eng & Contr 44:362-5 N 10 '15 Design and erection of the Pennsylvania lift bridge no. 458 over the south branch of the Chicago river, W. L. Smith, diag W Soc E J 20:478-88 My '15; Same, Ry R 56:519-24 Ap 17 '15; Same cond. Eng Rec 71:611-12 My 15 '15

Design, construction and detailed costs of the Richelieu river bridge, Lacolle Junction, Quebec. il diags Eng & Contr 42:542-6 D

Design, construction and detailed labor costs of the substructure of the double-leaf trunnion bascule bridge at Chicago avenue, Chicago, diags plan Eng & Contr 42:388-90

O 21 '14
Design features of a single-leaf trunnion bascule bridge over the Channel street waterway, San Francisco, Cal. diags plans Eng & Contr 44:248-50 S 29 '15
Design features of the Alger bridge, Columbus, Ohio—a 1,166-ft. reinforced concrete structure. diags Eng & Contr 44:206-9 S 15

Design features of the cantilever, simple-truss and girder spans of the Bloomfield bridge, Pittsburgh, diags Eng & Contr 42:240-3 S 9

Design features of the East Kansas avenue bridge over the Kansas river at Kansas City, Kan. diags Eng & Contr 43:496-9 Je 2 15

Design features of the substructure and approaches of the Bloomfield bridge, Pittsburgh, diags Eng & Contr 42:295-7 S 23 '14

Design of concrete highway bridges with special reference to standardization, C. B. Mc-Cullough, diags Eng & Contr 43:268-70 Mr

Design of substructures for wooden and combination highway bridges. G. E. Edgerton. Eng & Contr 44:250-3 S 29 '15

Design of the 531-ft. truss spans of the North side Point bridge, Pittsburgh, Pa. diags Eng & Contr 41:358-61, 684-5; 42:196-8 Mr 25, Je 17, Ag 26'14

Design of the main shoes of the new Quebec bridge. il diags Engineer 118:527-8 D 4 '14

Design of the reinforced concrete cantilever bridge on Runnymede avenue, Cincinnati. diags Eng & Contr 43:271-2 Mr 24 '15

Bridge design—Continued

Deterioration of steel bridges over railway tracks at Buffalo. R. J. Reidpath, il diags
Eng N 73:1144-7 Je 10 '15

Double-deck bascule bridge over Chicago river, H. E. Young, il diags Eng N 74:876-9
N 4 '15

N 4 '15
Double-leaf bascule railway bridge, il diags
Engineer 120:246-7 S 10 '15
Elastic curve applied to the design of the
Sciotoville bridge, D. B. Steinman, Eng Rec
72:258-60 Ag 28 '15
Eliminating the Tower Grove grade crossing
at St. Louis, il diags plan Eng N 74:52-5
J1 8 '15

Eliminating the Tower Grove grade crossing at St. Louis, il diags plan Eng N 74:52-5 Jl 8 '15

Fallsway viaduct in Baltimore built on sharp curve with concrete from 205-foot tower, il diags Eng Rec 71:544-5 My 1 '15

Five bridges erected in two days: unit system of reinforced concrete solves time element, il diags Eng Rec 71:172-4 F 6 '15

Highway bridge approach details, F. Barber, il Eng N 73:361-3 My 20 '15

Important questions on highway-bridge design, W. Whited, Eng N 73:106-8 Ja 21 '15

Late Thomas C. Keefer and the plans for the Victoria bridge at Montreal. Eng N 73:179-80 Ja 28 '15

Lift spans over Arkansas river designed for possible shifting of channel, il diags Eng Rec 72:667-70 N 27 '15

Long-span continuous-truss bridge over the Ohio, diags Eng N 74:64-6 Jl 8 '15

New and simplified derivation of the most general form of the theorem of three moments, G. A. Maney, diags Eng & Contr 43: 27-9 Ja 13 '15

New swing bridge over the Nile at Cairo, il diags Engineer 120:270-2, 274 S 17 '15

Ohio river bridge for the C., B. & Q. R. R. diag Eng N 74:230-2 Jl 29 '15

Ohio river bridge to contain longest riveted-truss spans in America, diags Eng Rec 71: 799-800 Je 26 '15

Ornamental arch effect secured by cantilever design, Chester, Pa. Eng Rec 71:164 F 6 '15

Overcrossing has provision for future side-walks, diags Eng Rec 72:203 Ag 14 '15

Pacific highway interstate bridge over the Columbia river and its approaches between Vancouver, Wash., and Portland, Ore. E. E. Howard, diags Eng & Contr 43:540-3 Je 16 '15

Pacific highway interstate bridge over the Co-lumbia river, Portland, Ore. E. E. Howard. diags Eng N 73:1218-21 Je 24 '15 Pacific highway interstate bridge; special pier and floor design feature, diags Eng Rec 72: 18-20 Jl 3 '15 Plea for beautiful bridges. H. G. Tyrrell. Assn Eng Soc J 54:35-43 Ja '15 Portland harbor bridge. il diags plan Eng N 74:824-9 O 28 '15 Provision for traction stresses in Quebec bridge. C. A. Norton. diags Eng Rec 71: 492-3 Ap 17 '15 Reinforced concrete bridges along the Colum-

492-3 Ap 17 '15 Reinforced concrete bridges along the Columbia highway in Oregon. K. P. Billner. il diags Eng & Contr 43:121-3 F 10 '15; Same. Eng N 72:1145-8 D 10 '14 Reinforced-concrete highway arch for grade separation. diags Eng Rec 70:703-4 D 26 '14 Reinforced-concrete viaduct at St. Louis, Mo. C: W. Martin, il diags Eng N 74:725-7 O 14 '15

14 '15

St. Louis municipal bridge east approach a steel viaduct nearly 3 miles long, diags Eng Rec 72:634-5 N 20 '15

Seventy years of civil engineering, il Sci Am 112:527-9 Je 5 '15

Steel arch highway bridge in the Hudson highlands, il map Eng N 74:856-7 O 28 '15

Street bridges in Philadelphia designed for permanent artistic effects, il diags Eng Rec 72:598-600 N 13 '15

Tables for determining the bending moments and shears in simple beams and in beams fixed at one and both ends, S. M. Cotten. Eng & Contr 43:335-40 Ap 14 '15

Two time-savers for use with influence lines. D. B. Steinman. Eng Rec 71:517 Ap 24 '15

Web reinforcement of notched plate-girders, Barton street bridge, Pawtucket, R. I. il diag Eng N 73:989 My 20 '15

Wind stresses in highway bridges. R. Fleming. Eng N 73:372-5 F 25 '15
Wind stresses in railroad bridges. R. Fleming. Eng N 73:252-6 F 11 '15
Wind stresses in skew bridges. J. P. J. Williams. Eng N 73:622-6 Ap 1 '15
See also Bridges—Load; Elevated railroads: Retaining walls See also Bridges-Le roads; Retaining walls

Bridge failures

Bridge curio fails at Red Bank, N. J.—are all
failures fortuitous? il Eng N 74:784-6 O 21

Bridge sidewalk failure due to paving expansion, Dallas, Texas. il diag Eng N 73:92 Ja 14 '15

Collapse of arch falsework, Detroit-Superior bridge, Cleveland. il Eng N 73:1244-5 Je 24

Collapse of unstiffened timber Howe bridge. il Eng N 74:222 Jl 29 '15 Concrete arch forms fall as steel trusses collapse. il Eng Rec 71:798 Je 26 '15 Flood wrecks masonry bridges. il Eng N 74:

546 S 16 '15 lip of approach embankment damages con-crete bridge, Herkimer, N. Y. A. T. Clark. il Eng N 74:771 O 21 '15

Bridge inspection

ridge inspection
Difficulty of thorough bridge inspection. F. H.
Fay. il Ry R 57:567-8 O 30 '15
Inspection and maintenance of highway
bridges. il Eng N 74:604-5 S 23 '15
Instructions governing the inspection of
bridges, culverts and waterways on the Missouri-Pacific Ry. Eng & Contr 44:393-4 N

Bridge moving

Bridge moving
Actual operations in connection with the shifting of double-track swing spans on the Chicago & Northwestern Ry, at Milwaukee, il Eng & Contr 43:359-60 Ap 21 '15
Design and construction work preliminary to the actual shifting of a double-track swing bridge on the Chicago & Northwestern Ry., at Milwaukee, plans Eng & Contr 43:356-9 Ap 21 '15
How the Chicago & North Western railway replaced its Milwaukee bridge, il diags Eng Rec 71:462-3 Ap 10 '15
Rebuilding the Muskingum bridge near Coshocton, il diags Eng N 74:105-8 Jl 15 '15
Renewing heavy swing span by floating into place; old North Western bridge in Milwaukee removed and new span weighing 800 tons placed in one day, il plan Ry Age 58:836-8 Ap 16 '15
Replacing a large truss bridge by lateral movement, J. C. Bland and J; Miller, il Ry Age 58:460-2 Mr 12 '15
Shifting two Milwaukee remover days.

Shifting two Milwaukee river drawbridges C. & N. W. Ry. il Eng N 73:657-8 Ap 8 '18 Bridge patents. See Bridges—Patents

Bridge portals

Decorating a city bridge with structural-steel portals. il Eng N 74:1086 D 2 '15

Bridge protection. See Bridges, Iron and steel-Protection

Bridge removal. See Bridges-Removal

Bridge shops

Fabricating steelwork for the Hell Gate arch. il Eng Rec 70:684-6 D 26 '14

Hell Gate bridge in the shop. il Eng N 72:1116-18 D 3 '14

Spacing table in the structural shop: equipment in Fort Pitt bridge works. G: P. Thomas. il Iron Age 95:139-41 Ja 14 '15

Bridge traffic Wood block and granite for bridge floors. E: A. Byrne. il diags Munic Eng 48:337-9 Je '15

Bridge works. See Bridge shops

Bridgeport, Connecticut
City street traffic investigation; Bridgeport,
Conn. A. F. Muller. plan Eng N 73:111-12 Ja

21 '15 Bridges

Apportionment of cost of highway bridges between street railways and cities; with discussion. C: M. Spofford, il diags W Soc E J 20:405-43 My '15

Bridges -- Continued

Bridge cost record used by the Illinois high-way commission. Eng & Contr 42:200-3 Ag way c

way commission. Eng & Contr 42:200-3 Ag 26 '14
Bridges and buildings in cities, 1915; tabulation. Munic Eng 48:267-8 Ap '15
Completing the new Mississippi river bridge at St. Louis. Eng N 73:954-5 My 13 '15
Construction and cost data on some highway bridge work in Alaska. F. A. Pope. Eng & Contr 42:387-8 O 21 '14
Construction and maintenance of roads and bridges from July 1, 1913, to December 31, 1914. U S Agric Bul 284:1-64 '15
Construction details of bridge across Portland harbor, il diag Eng N 74:865-8 N 4 '15
Construction of wooden and combination highway bridges. G. E. Edgerton, diags Eng & Contr 44:289-91 O 13 '15
County road bridges in 1915; tabulation. Munic Eng 48:268-70 Ap '15
Design and construction of the Lower Ganges bridge in India, il diags map Eng & Contr 42:478-81 N 18 '14
Design features of the East Kansas avenue bridge over the Kansas river at Kansas City, Kan, diags Eng & Contr 43:496-9 Je 2 '15
Discussion of the administrative and design features of highway bridge and culvert work. A. Marston. Eng & Contr 42:589-90
D 23 '14
Eleven-span wooden arch bridge of fifty years ago, il Eng Rec 71:142 Ja 30 '15

D 23 '14

Eleven-span wooden arch bridge of fifty years ago, il Eng Rec 71:142 Ja 30 '15

Highway bridges and structures. W. S. Gearhart. Good Roads n s 10:254-7 N 6 '15

Instructions to employees governing bridge work by Pennsylvania state highway department. Eng & Contr 43:32-3 Ja 13 '15

Iowa state highway bridges not too heavy. Eng Rec 71:138-9 Ja 30 '15

Methods and equipment used in constructing the superstructure of the Detroit-Superior high level bridge in Cleveland, O. il diags Eng & Contr 44:10-13 J1 7 '15

Summary of bridge work done by Wisconsin highway commission during period July 1, 1911-Jan. 1, 1915. Eng & Contr 43:457-8 My 19 '15

See also Arches; Bridge design and other headings beginning Bridge; Culverts; Draw-bridges; Elevated railroads; Girders; Mili-tary bridges; Pontoon bridges; Trestles; also names of cities, subhead Bridges

## Abutments

Earth-backed abutments for concrete arches. diags Eng N 74:786-7 O 21 '15

## Approaches

Sec Bridge approaches

## Cost

Cost

Construction of the Twelfth street traffic-way viaduct, Kansas City, Mo. E. E. Howard, diags Eng & Contr 44:331-2 O 27 '15

Cost of concrete culverts and bridges in Milwaukee county, Wisconsin, in 1913. il Eng & Contr 42:486-7 N 18 '14

Cost of highway bridges. C: M. Spofford. Elec Ry J 46:53-4 Jl 10 '15

Cost of railway footbridges. diags Engineer 120:197-9, 221-3, 240-2, 266-8 Ag 27-S 17 '15

Costs of bridges for grade-crossing elimination. C. N. Bainbridge. Eng Rec 71:770 Je 19 '15

'15

19 '15
Design, construction and detailed costs of the McKinley Ford bridge, La Salle county, Ill. il diags Eng & Contr 43:179-82 F 24 '15
Design, construction and detailed costs of the Richelieu river bridge, Lacolle Junction, Quebec. Eng & Contr 42:585-9 D 23 '14
Design, construction and detailed labor costs of the substructure of the double-leaf trunnion bascule bridge at Chicago avenue, Chicago. C. O. Johnson. il Eng & Contr 42: 426-33 N 4 '14

## Damages from floods, etc.

Highway bridges and structures. W. S. 6 hart. Good Roads n s 10:254-7 N 6 '15

How a washed-out bridge-span was pulled out of a river, plan Eng N 73:634 Ap 1 '15

Erection

Bridge renewal without falsework or inter-ference with traffic. il diag Ry Age 58:318-19 F 19 '15

Building the new Quebec bridge; the world's largest truss span, il Iron Tr R 56:562-3 Mr

18 '15 Contractors span 180-foot canyon without using falsework, il Eng Rec 71:181-2 F 6 '15 Design 'and construction work preliminary to the actual shifting of a double-track swing bridge on the Chicago & Northwestern Ry., at Milwaukee, plans Eng & Contr 43:356-9 Ap 21 '15 Design and erection of the Pennsylvania lift

43:35b-9 Ap 21 '15 Design and erection of the Pennsylvania lift bridge no. 458 over the south branch of the Chicago river, W. W. Priest, il diag W Soc E J 20:488-500 My '15; Same, Ry R 56:524-8 Ap 17 '15; Same cond. Eng Rec 71:613 My 15

Dropping old timber trestles with dynamite. J. H. Stack. il Ry Age 58:1079-80 My 21 '15 Economical method of replacing trusses with girders. S. T. Corey. il diags Ry Age 58: 1077-9 My 21 '15 Erecting railroad viaduct superstructure. il diags Eng Rec 70:668-70 D 19 '14 Erecting reinforced concrete trestles. E. M. Grime. il Ry Age 58:1080 My 21 '15 Erection at Hell Gate arch checks calculations. il Eng Rec 72:220-1 Ag 21 '15 Erection of 591-ft, steel arch begun at Cleveland. il Eng N 71:283 Ag 5 '15 Erection of new Outbee bridge, H. P. Borden.

Erection of 591-ft. steel arch begun at Cleveland. Il Fing N 74233. Ag 5 15
Erection of new Quebec bridge. H. P. Borden. il Eng Rec 71:80-1 Ja 16 '15
Erection of steel arch span, Detroit-Superior viaduct. il diags Eng N 74:366-7 Ag 19 '15
Erection progress on the Quebec bridge. il Eng & Contr 44:170-1 S 1 '15
Erection traveler, new Quebec bridge. H. P. Borden. il plans Eng N 73:417-22 Mr 4 '15
Heavy travelers erect Hell Gate arch over East river, il Eng Rec 71:568-70 My 1 '15
Hell Gate arch erection from Ward's island started; views. Eng Rec 71:789 Je 19 '15
Longest riveted simple trusses erected around old bridge by cantilever method at Pittsburgh, il diags Eng Rec 72:82-4 Jl 17 '15
Methods and equipment used in erecting girder spans of Pennsylvania avenue viaduct, Kansas City, Mo. W: F. Wynne. il plan Eng & Contr 43:539-40 Je 16 '15
New methods evolved in building world's largest bridge; Quebec erection. il Eng Rec 72: 96-100 Jl 24 '15
96-100 Jl 24 '15
977-ft. Hell Gate bridge becomes an arch. il Eng N 74:70-9 O 7 '15
Piecemeal erection of a bridge on the Boston & Maine R. R. K. W. Lemcke. il diags Eng N 74:1057-9 D 2 '15
Placing through girder spans by lateral movement. E. W. Fair. Ry Age 59:349 Ag 20 '15

Placing through girder spans by lateral movement. E. W. Fair. Ry Age 59:349 Ag 20 '15 Progress of erection of the new Quebec bridge. Il plate (supp) Engineer 120:416-17 bridge.

O 29 '15
Progress of the new Quebec bridge, il plan
Engineer 119:101-3 Ja 29 '15
Progress on Hell Gate bridge, New York
city, il Eng N 74:236-7 Jl 29 '15
Proposed centering for large-span stone
bridges, S. Berg, diags Engineer 119:472-4,
521-3, 569-70 My 14, 28, Je 11 '15
Quebec bridge work in 1915, il Eng N 74:473-5
S 2 '15

a concrete girder bridge with screw W. R. Mason. Eng & Contr 44:209 Raising a jacks.

Rapid erection of temporary timber bridge. S. C. Corson, il Eng N 74:268 Ag 5 '15
Rebuilding the Muskingum bridge near Coshocton, il diags Eng N 74:105-8 Jl 15 '15
Record set for weight of steel erected in one day at Randall's island on Hell Gate bridge approach, il Eng Rec 71:399-400 Mr 27 '15
Renewing a busy main line bridge on the Santa Fe. L. C. Lawton, il Ry Age 59:350-1
Ag 20 '15
Renewing heavy swing span by floating into place; old North Western bridge in Milwaukee removed and new span weighing 800 tons placed in one day, il plan Ry Age 58:386-8 Ap 16 '15
Replacing a small bridge over a highway.
C. V. Chamberlin, il Ry Age 58:1081 My 21 '15

See Bridge design

Bridges-Erection -- Continued

Replacing Howe truss spans without falsework, J. B. Sheldon, il Ry Age 59:349-50 Ag 20 '15

Ag 20 '15 Work on the new Quebec bridge during the first erection season, H. P. Borden, il Eng N 73:1-4 Ja 7 '15 World's longest arch, across Hell Gate, New York city, is closed and swung as planned, il Eng Rec 72:438-40 O 9 '15

See also Bridges-Reconstruction

#### Estimates

Estimating curves for standard bridges of the Illinois highway department. G. F. Burch. il diags Eng & Contr 43:123-6 F 10 '15; Same cond. Eng Rec 72:171-2 Ag 7 '15

#### Fires

Fires

Bridge-floor fire destroys Detroit-Belle Isle
bridge. il Eng N 73:906-7 My 6 '15

Expansion-joint action in Connaught bridge
fire. il Eng N 73:1035 My 27 '15

Fire damage to steel viaduct and method of
repair. il diags Eng N 74:1037-9 N 25 '15

Fire wrecks ten spans of Belle Isle bridge,
Detroit. Eng Rec 71:599 My 8 '15

Wood-block bridge-floor fire, Vancouver,
H. F. Jefferson. il Eng N 73:955-6 My 13 '15

#### Floors

Asphalt pavement slides off bascule bridge. il Eng N 73:1051 My 27 '15 Concrete bridge floors. Concrete Cem 6:298

ongress street bridge across the Hudson river at Troy, N. Y.; structural features. H: W. Hodge. diags Eng N 73:574-5 Mr 25 Congress

Creosoted wood blocks suitable for bridge floors if fireproofed. L. T. Ericson. Eng Rec \_71:724 Je 5 '15

Floors for steel highway bridges in Illinois. C. Older. diags Eng Rec 70:664-5 D 19 '14; Same. Eng & Contr 43:8-10 Ja 6 '15; Same; with discussion. Good Roads n s 9:60-4 F 6

"15 Methods used to waterproof bridge floors. Eng & Contr 43:399-400 My 5 '15
Paving problems of Queensboro bridge, New York, il Eng N 74:396-7 Ag 26 '15
Recent tendencies in concrete ballasted deck construction. Ry Age 58:728 Ap 2 '15
Reinforced concrete floor for beam spans designed to replace a wooden floor. C. E. Nagel, diags Eng & Contr 43:313-14 Ap 7 '15
Results of tests to determine the distribution of loads from concrete floor slabs to steel joists; abstracts. Eng & Contr 44:365-7 N 10 '15; Eng Rec 72:578-80 N 6 '15; Eng N 74: 933 N 11 '15
Solid deck trestles and bridges on the Illinois Central, il diags Ry Age 59:279-80 Ag 13

'15 Surfacing bridges. F. R. Lander. il Munic Eng 49:50-1 Ag '15 Waterproofing solid steel-floor bridges; abstract. S: T. Wagner. Eng & Contr 43:79-81 Ja 27 '15; diags Ry R 56:273-7 F 27 '15; Revised specifications. Eng & Contr 41:209-11 S 15 '15; Discussion. A. W. Carpenter. Ry R 56:557-8 Ap 24 '15

Wisconsin concrete bridge floor drains placed under curb. il Eng Rec 72:604 N 13 '15

Wood block and granite for bridge floors. E: A Byrne. il diags Munic Eng 48:337-9 Je '15 Wood block replaces plank as steel bridge flooring. E: Stingel. Eng Rec 71:300 Mr 6 '18

## Foundations and piers

Blocking of concrete bricks used in raising steel bridge, R. C. Hardman, Eng Rec 72: 460 O 9 '15

Bridge foundations and the use of pneumatic caissons for constructing bridge foundations in Canada. diags Eng & Contr 42:298-301 S 23 '14

Building concrete caissons in the Platte river. J. H. Merriam. il diags Ry Age 59:383-6 Ag 27 '15

Chattanooga creek bridge of the N. C. & St. L. C. H. Johnson, il plan Ry Age 59:343-5 Ag 20 '15

Concrete pier work on the Cumberland valley R. R. bridge over the Potomac. il Eng N 73: 124-5 Ja 21 '15

R. R. bridge over the Potomac. il Eng N 73: 124-5 Ja 21 '15
Concrete viaduct of a new type; eastern viaduct, New York Connecting R. R. il diags Eng N 73:886-7 My 6 '15
Deep bridge piers sunk without air. il diags Eng N 74:70-4 Jl 8 '15
Design and construction of the substructure of the Buffalo river lift bridge, Buffalo, N. Y. il diags Eng & Contr 44:362-5 N 10 '15
Design, construction and detailed labor costs of the substructure of the double-leaf trunnion bascule bridge at Chicago avenue, Chicago. diags plan Eng & Contr 42:388-90, 426-33 O 21, N 4 '14
Design features of the substructure and approaches of the Bloomfield bridge, Pittsburgh, diags Eng & Contr 42:295-7 S 23 '14
Design of substructures for wooden and combination highway bridges. G. E. Edgerton. Eng & Contr 44:250-3 S 29 '15
Economical bridge-pier foundation, Coos bay, Oregon. M. K. Temple, il Eng N 73:609-10
Ap 1 '15
Elastic yield of rock foundation of a bridge pier. Eng N 73:1035 My 27 '15
Fall River, Mass., bridge. J. W. Rollins. il diags Boston Soc C E J 1:67-81 F '14
Floating-pile foundation in silt. il diags Eng N 73:770-1 Ja 28 '15
Interesting structure over the Buffalo river. il diag map Ry Age 59:465-7 S 10 '15
Jacking up a concrete arch over a settling pier. W. P. Darwin, il Eng N 73:588-9 Mr 25 '15
Mud lake bridge substructure. il diag Eng Rec

Mud lake bridge substructure, il diag Eng Rec 70:688 D 26 '14
Nothing heavier than two-by-four used for tall pier forms. R. C. Hardman, il diags Eng Rec 71:726 Je 5 '15
Overcoming defective foundations for three piers. C. E. Smith, il plan Ry Age 57:1151-5 D 18 '14

D 18 '14 Pile and timber trestle bridges. Ry Age 59: 754-6 O 22 '15 Portland viaduct. W. B. Conant. il diags Munic J 39:499-502 S 30 '15 Rebuilding piers and abutments, Black river bridge. E: U. Smith. il diags Eng N 74:1046-7 N 25 '15 Publisator's Platte viver

Rebuilding the Burlington's Platte river bridge, J. H. Merriam, il diags Eng N 74: 728-32 O 14 '15

728-32 O 14 '15
Recent cylinder pier construction, J. E. Bebb.
il Ry Age 59:347-8 Ag 20 '15
Reconstruction of piers of Little Rock Junction bridge across the Arkansas river at Little Rock. C. E. Smith. diags plan Eng & Contr 44:85-8, 124-7 Ag 4, 18 '15
Sand-braced pile pier. diag Eng N 73:890 My 6

sand-braced pile pier, diag Eng N 13:590 My 6

15

Special pier and floor design feature Pacific highway interstate bridge, diags Eng Rec 72:18-20 Jl 3 '15

Substructure conditions fix design of Chicago & North Western bridge at Pekin, C. F. Dalston, diags Eng Rec 71:425-7 Ap 3 '15

Substructure features of a bridge over the South Canadian river in Oklahoma and erection procedure adopted, diags Eng & Contr 43:397-9 My 5 '15

Substructure for new Memphis bridge, M. B. Case, il Eng Rec 71:518-20 Ap 24 '15; Same, Ry Age 58:877-81 Ap 23 '15; Same cond. Ry R 56:554-6 Ap 24 '15; Same cond. Eng N 73: 792-3 Ap 22 '15

Substructure for the Jackson street bridge over the Chicago river, il diags Eng N 73: 550-2 Mr 18 '15

Substructure of the Lake street bascule bridge at Chicago, H. E. Young, il Eng N 74:934-6 N 11 '15

N 11 '15

Substructure of the Trent river bridge, diags Eng Rec 71:44 Ja 9 '15 See also Bridges—Abutments; Cofferdams; Piles and pile driving

## Inspection

See Bridge inspection

## Load

Chart of equivalent uniform loads for railway bridges. D. B. Steinman, Eng N 73:780-2 Ap

ridges-Load -Continued

Equivalent uniform loads for long-span bridges, D. B. Steinman, Eng N 73:370 F

Liverted bridge which should have failed carries heavy load. il Eng Rec 72:22 Jl 3 '15 Overloads allowed in operating railroad bridges. J. E. Greiner. Eng Rec 72:387 S 25

Results of tests to determine the distribution estitis of tests to determine the distribution of loads from concrete floor slabs to steel joists; abstracts. Eng & Contr 44:365-7 N 10 '15; Eng Rec 72:578-80 N 6 '15; Eng N 74:933 N 11 '15

## Reconstruction

Bridge renewal without falsework or interference with traffic, il diag Ry Age 58:318-19 F 19 '15
Dismantling truss spans and erecting plate girders without false work, W. & L. E. R. R. E. U. Smith, il diags Ry R 56:340-2

Economical method of replacing trusses with girders. S. T. Corey. il diags Ry Age 58:1077-9 My 21 '15

Erecting new trusses on a canal bridge and dam. W. R. Browne, il diags Eng N 74:173-4 Jl 22 '15 Lifting one truss of a bridge to place larger shoe. W. R. Browne. il diags Eng N 73:1034-5 My 27 '15

5 My

5 My 27 '15
New bridge across the Missouri river at Sibley, Mo. il diags Ry Age 59:13-16 Jl 2 '15
Raising a highway bridge by end-pin slings.
R. C. Hardman. il Eng N 73:352-3 F 18 '15
Rebuilding piers and abutments, Black river
bridge. E: U. Smith. il diags Eng N 74:10467 N 25 '15
Rabuilding the Burlington's Platte river

Rebuilding the Burlington's Platte river bridge, J. H. Merriam, il diags Eng N 74: 728-32 O 14 '15

728-32 O 14 '15
Reconstruction of Mississippi river bridge at Keokuk. diag Eng N 74:260-2 Ag 5 '15
Reconstruction of piers of Little Rock Junction bridge across the Arkansas river at Little Rock. C. E. Smith. diags plan Eng & Contr 44:85-8, 124-7 Ag 4, 18 '15
Removing through trusses without dismantling, il Ry Age 58:474 Mr 12 '15
Renewing a busy main line bridge on the Santa Fe. L. C. Lawton, il Ry Age 59:350-1
Ag 20 '15
Renewing bridges under traffic on the Wheel-

Ag 20 '15 Renewing bridges under traffic on the Wheeling & Lake Erie R. R. il Eng & Contr 43: 314 Ap 7 '15 Renewing Howe trusses without delay to traffic. J. J. Wishart. il Ry Age 58:1081-2 My 21 '15

Replacing a large truss bridge by lateral movement. J. C. Bland and J; Miller. il Ry Age 58:460-2 Mr 12 '15
Replacing truss bridges by deck plate-girders under traffic, W. & L. E. R. R. E. U. Smith, il diags Eng N 73:491-3 Mr 11 '15
Supporting a Pratt-truss span during the reconstruction of its abutments. il Eng & Contr 43:360-1 Ap 21 '15

See also Bridges-Repair

## Removal

Cutting up a bridge with the oxyhydrogen torch, il Sci Am 112:71 Ja 16 '15 Dropping old timber trestles with dynamite. J. H. Stack, il Ry Age 58:1079-80 My 21 '15

See also Bridge moving

## Repair

Coating disintegrated stone abutments with concrete, il Eng Rec 71:337-8 Mr 13 '15 Fire damage to steel viaduct and method of repair, il diags Eng N 74:1037-9 N 25 '15 Lifting bridge trusses to adjust rollers. H. T. Welty, il diag Eng N 74:555-6 S 16 '15 Overcoming defective foundations for three piers. C. E. Smith, il plan Ry Age 57:1151-5 D 18 '14

Raising the washed-out Dos Rios bridge. F. W. Haselwood, il diag Eng N 73:782-3 Ap 22 '15

Repair work on the Dallas-Oak Cliff viaduct. diag Eng N 73:1052 My 27 '15

Replacing pins in a railway bridge under traffic, il Eng N 73:684-5 Ap 8 '15

Selection and use of bridge and building tools, S. C. Tanner, il Ry Age 59:339-40 Ag 20 '15 Steel billets needle bridge shoe in quarters too close for beams. T. J. Wilkerson. il diags Eng Rec 72:88 Jl 17 '15 Unique method for the replacement of trusses, il Ry Age 58:156-7 Ja 22 '15

See also Bridges-Reconstruction

#### Specifications

General specifications for bridge work of Illinois state highway commission. Eng & Contr 42:390-2 O 21 '14

Specifications for waterproofing solid steel-floor railroad bridges. S: T. Wagner. Eng & Contr 43:79-81 Ja 27 '15; Same rev. Eng & Contr 44:209-11 S 15 '15

Bridges, Arched

Architectural effects secured in Glens Falls arch bridge over Hudson river, il diags Eng Rec 72::574-6 N 6 '15 Bridge work of the C. M. & St. P. Ry. il plan Ry R 56:335-8 Mr 13 '15 Cabrillo bridge at the San Diego exposition, il diags Eng N 73:926-8 My 13 '15 Closing Detroit-Superior arch. il Eng N 74: 813-14 O 21 '15

813-14 O 21 15 Construction of the Gwynns Falls arch bridge, il diag Ry Age 57:1037-40 D 4 '14 Construction of the Hallstead cut-off, D. L. & W. R. R.: Tunkhannock viaduct and Mar-tin's Creek viaduct. il diags Ry R 56:143-8 Ja

Joseph and construction of provincial high-way bridge at Mestre, Italy. A. M. Wolf. diags Concrete Cem 6:294-6 Je '15 Details of main span of Detroit-Superior bridge at Cleveland: diags Eng Rec 70:640-1

114

D 12 14
Erection of steel arch span, Detroit-Superior viaduct, il diags Eng N 74:366-7 Ag 19 '15
Fast concreting on Brooklyn-Brighton viaduct, Cleveland, il diags Eng N 74:481-6 S 9 '15
Graphical analysis of arches with fixed ends greatly simplified. C. S. Whitney. Eng Rec 72:324-6 S 11 '15
Handling steel centers for concrete arches. H. E. Ketchum, il Eng N 74:462-3 S 2 '15
Hell-Gate arch bridge and the New York Connecting railroad, il diag map Ry R 57:453-61 O 9 '15
Largest arch bridge in the world: Hell Gate

Hell-Gate arch bridge and the New York Connecting railroad. Il diag map Ry R 57:453-61 O 9 '15
Largest arch bridge in the world; Hell Gate bridge. il Sci Am 113:340-1+ O 16 '15
Method for determining two-hinged arch reactions. C. S. Whitney. Eng & Contr 44: 123-4 Ag 18 '15
Methods and equipment used in constructing the superstructure of the Detroit-Superior high level bridge in Cleveland, O. il diags Eng & Contr 44: 10-13 Jl 7 '15
New concrete arch viaduct of the Philadelphia, Baltimore & Washington R. R. over Gwynns Falls. Baltimore. il plans map Ry R 56:345-8 Mr 13 '15
977-ft. Hell Gate bridge becomes an arch. il Eng N 74:708-9 O 7 '15
Old English bridge replaced by new flat-arch structure. diags Eng Rec 71:720-1 Je 5 '15
Ornamental bridge at Akron built of slag concrete. il Eng N 74:769-70 O 21 '15
Proposed centering for large-span stone bridges. S. Berg. diags Engineer 119:472-4, 521-3, 569-70 My 14, 28, Je 11 '15
Reinforced-concrete arch bridge has stone facing. il Eng Rec 72:164-5 Ag 7 '15
Reinforced-concrete highway arch for grade separation. diags Eng Rec 70:703-4 D 26 '14
Steel arch bridge on curved gradient in the Bietsch valley. il diags Engineer 118:549-50 D 11 '14; Same cond. Eng M 48:750-1 F '15
Tunkhannock viaduct nearing completion. il

Tunkhannock viaduct nearing completion, il Eng Rec 72:42-3 Jl 10 '15

World's longest arch, across Hell Gate, New York city, is closed and swung as planned. il Eng Rec 72:438-40 O 9 '15

Bridges, Bascule
Bascule bridge at Sault Ste. Marie acting as a simple truss span, il diags Eng N 73:108-10 Ja 21 '15

Chehalis river temporary bascule bridge, il diags Eng Rec 71:17 Ja 2 '15

Bridges, Bascule—Continued

Deep bridge piers sunk without air, il diags

Eng N 71:70-1 J1 8 '15

Design and construction of the sub-structure

of the Buffalo river lift bridge, Buffalo,

N. Y. il diags Eng & Contr 44:362-5 N 10 '15

Design, construction and detailed labor costs

of the substructure of the double-leaf trun
nion bascule bridge at Chicago avenue, Chi
cago, diags plan Eng & Contr 42:388-90, 426
33 O 21, N 4 '14

Design features of a single-leaf trunnion

23 O 21, N 4 '14

Design features of a single-leaf trunnion bascule bridge over the Channel street waterway, San Francisco. diags plans Eng & Contr 44:248-50 S 29 '15

Design features of the Gatun river bascule bridge, Panama Canal Zone. P. L. Kaufman. plan Eng & Contr 44:13-14 Jl 7 '15

Development of the Sudan. il map plans diags Engineer 119:271-4 Mr 19 '15

Double-deck bascule bridge over Chicago river. H. E. Young. il diags Eng N 74:876-9 N 1 '15

Double-leaf bascule railway bridge, il diags Engineer 120:216-7 S 10 '15
Interesting structure over the Buffalo river, il diag map Ry Age 59:465-7 S 10 '15
New Haven road to build new Thames river bridge, Eng N 74:1053 N 25 '15
Rail-end connections for bascule bridges, il diag Eng N 73:1216-17 Je 24 '15
Rolling lift bridges for the Delray connecting railroad, il Ry R 56:359-60 Mr 13 '15
Small bascule bridge; Pere Marquette R. R. il diags plan Eng N 73:929 My 13 '15
Substructure of the Lake street bascule bridge at Chicago, H. E. Young, il Eng N 71:934-6 N 11 '15
Trolley wire on double-leaf bascule bridge, S. L. Foster, diags Elec Ry J 46:1042-4 N 20 '15
Bridges, Cantilever

Bridges, Cantilever

Ridges, Cantilever

Balanced cantilever reinforced-concrete bridge,
Chester, Penn. H: H. Quimby. il diags Eng
N 73:578-81 Mr 25 '15

Construction features of the Bloomfield bridge,
Pittsburgh, Pa. A. E. Sortore. il Eng &
Contr 43:6-8 Ja 6 '15

Construction features of the Bloomfield bridge,

Construction features on the reinforced concrete cantilever bridge on Runnymede avenue, Cincinnati, il Eng & Contr 43:312-13

Design features of the cantilever, simple-truss and girder spans of the Bloomfield bridge, Pittsburgh, Pa. diags Eng & Contr 42:240-3

Design features of the substructure and approaches of the Bloomfield bridge, Pittsburgh, diags Eng & Contr 42:295-7 S 23 '14
Design of the reinforced concrete cantilever bridge on Runnymede avenue, Cincinnati, diags Eng & Contr 43:271-2 Mr 24 '15
Erection traveler, new Quebec bridge, H. P. Borden, il plans Eng N 73:417-22 Mr 4 '15
Hopple street viaduct, Cincinnati, il diags Munic J 39:179-83 Ag 5 '15
Ornamental arch effect secured by cantilever design, Chester, Pa. Eng Rec 71:164 F 6 '15
Provision for traction stresses in Quebec bridge, C. A. Norton, diags Eng Rec 71:492-3
Ap 17 '15
Reinforced-concrete cantilever bridges, A. R.

Ap 17 '15 Reinforced-concrete cantilever bridges. A. B. Hill; L. F. Smith; F. H. Frankland, il Eng N 73:790-2 Ap 22 '15

Bridges, Concrete

Architectural effects secured in Glens Falls arch bridge over Hudson river. il diags Eng Rec 72:574-6 N 6 '15

Balanced cantilever reinforced-concrete bridge, Chester, Penn. H: H. Quimby, il diags Eng N 73:578-81 Mr 25 '15

Belgian bridge in reinforced concrete. Sci Am 112:335 Ap 10 '15

Bridge work of the C. M. & St. P. Ry. il plan Ry R 56:335-8 Mr 13 '15

Bridges and viaducts on the Multnomah county section of the Columbia river highway. Il Good Roads n s 10:243-7 N 6 '15 Building a long concrete viaduct at St. Louis. P. A. Richardson. il Eng Rec 70:692-3 D 26 '14

Cabrillo bridge at the San Diego exposition. il diags Eng N 73:926-8 My 13 '15

Casting concrete-slab bridges for the Pennsylvania. R. R. L. M. Schrufer. il diag Eng N 74:125-6 Jl 15 '15
Completing the summit cut-off of the Lackalwanna. il Ry Age 59:809-10 O 29 '15
Concrete arch bridge at Saskatoon. il diags Eng N 73:434-6 Mr 4 '15
Concrete bridges with stone and brick facing C. E. Drayer. il Eng N 73:1214-15 Je 24 '1i
Concrete highway bridges: some data or highway bridges in Illinois. C. Older. Eng & Contr 44:332 O 27 '15
Concrete viaduct at San Diego. il Munic Eng 49:105-6 S '15

49:105-6 S '15
Concrete viaduct of a new type; eastern viaduct, New York Connecting R. R. il diag: Eng N 73:886-7 My 6 '15
Concrete viaducts on the Pennsylvania rail road. D. A. Willey, il Sci Am S 79:24 Ja 9 '1.
Construction features of the duplicate rein forced concrete arch bridges at Third ave. Cedar Rapids, Iowa. diags Eng & Contr 42 148-50 Ag 12 '14
Construction features of the reinforced concrete cantilever bridge on Runnymede avenue, Cincinnati. il Eng & Contr 43:312-1

Construction of the Gwynns Falls arch bridge il diag Ry Age 57:1037-40 D 4 '14 Construction of the Hallstead cut-off, D. L. & W. R. R.: Tunkhannock viaduct and Martin's Creek viaduct. il diags Ry R 56:143-8 J 30 '15

30 '15 Construction of the Twelfth street traffic-wa viaduct, Kansas City, Mo. E. E. Howard diags plan Eng & Contr 44:328-32 O 27 '1 Contractors to replace \$20,000 worth of concrete bridge work. J. H. Ames. il Concret Cem 7:101-6 S '15 Pote on reinforced concrete railroad bridge

Contractors to replace \$20,000 worth of correct bridge work. J. H. Ames. il Concret Cent 7:104-6 S '15
Data on reinforced concrete railroad bridge and extent to which such bridges are used diags plan Eng & Contr 43:29-32 Ja 13 '15
Design and construction of a reinforced correte truss bridge with braced counterfor abutments near Merthyr, Wales. C: E. Ho loway. diags Eng & Contr 44:390-2 N 17 '15
Design and construction of provincial high way bridge at Mestre, Italy. A. M. Woldiags Concrete Cem 6:294-6 Je '15
Design and construction of the Langwies via duct—Chur-Arosa R. R., Langwies, Switzel land. A. M. Wolfe. il diags Concrete Cem 6:234-6 Je '15
Design and construction of the Larz Andersc bridge over the Charles river, Cambridge and Boston, Mass. il plans Eng & Contr 4 331-8 O 7 '11
Design and construction of the Main stre reinforced concrete viaduct at Fort Wort Tex. S. W. Bowen. diags Eng & Contr 4 211-17 Mr 10 '15
Design and construction of the San Jacin street reinforced concrete bridge, Housto Texas. il diags Eng & Contr 42:492-5 N 25' Design, construction and detailed costs of reinforced concrete girder bridge over Re Cedar river, Michigan. R. A. Small. il diage Eng & Contr 44:49-53 Jl 21 '15
Design features of the Alger bridge County, I il diags Eng & Contr 43:179-82 F 24 '15
Design features of the Alger bridge, Colun bus, Ohio—a 1,166-ft. reinforced concrete structure. diags Eng & Contr 44:206-9 S '15
Design of concrete highway bridges wi

pesign of concrete highway bridges wi special reference to standardization, C. McCullough, diags Eng & Contr 43:268-Design Mr 24 '15

Design of the reinforced concrete cantilev bridge on Runnymede avenue, Cincinna diags Eng & Contr 43:271-2 Mr 24 '15

Erecting reinforced concrete trestles. Grime. il Ry Age 58:1080 My 21 '15

Fallsway viaduct in Baltimore built on sha curve with concrete from 205-foot tower. diags Eng Rec 71:544-6 My 1 '15 Fast concreting on Brooklyn-Brighton via duct, Cleveland, il diags Eng N 74:481-6 S

Features of the Tunkhannock creek viadu recently completed at Nicholson, Pa. il En & Contr 44:389-90 N 17 '15

ridges. Concrete -- Continued

Five bridges erected in two days; unit system

ridges, Concrete—Continued

Five bridges erected in two days; unit system of reinforced concrete solves time element. il diags Eng Rec 71:172-4 F 6 '15; Same cond. Eng M 49:109-11 Ap '15

Flat-slab bridges at Denver combine permanency and good appearance. W. H. Wheeler and C. A. P. Turner. il diag Eng Rec 72:38-40 Jl 10 '15

Forms built before supporting falsework for concrete bridge. R. C. Hardman. diags Eng Rec 72:492 O 16 '15

Haights Run bridge erected for city of Pittsburgh. il Concrete Cem 5:244 D '14

Half-mile concrete viaduct provides doubledek trafficway in Kansas City. H. H. Fox. il diags Eng Rec 71:164-6 F 6 '15

Handling steel centers for concrete arches. H. E. Ketchum. il Eng N 74:462-3 S 2 '15

Hopple street viaduct, Cincinnati. il diags Munic J 39:179-83 Ag 5 '15

Light ornamental bridge, Abington, Mass. il Eng N 74:97 Jl 15 '15

Low-water bridges over torrential streams, Bexar co., Texas. T. Bartlett. il diags Eng N 73:628-30 Ap 1 '15

Methods and costs in constructing the 450-ft. East Fourth street viaduct at Fort Worth, Texas. E. W. Robinson. il Concrete Cem 5: 231-8 D '14

New concrete arch viaduct of the Philadelphia, Baltimore & Washington R. R. over Gwynns

Texas. E. W. Robinson. il Concrete Cem 5: 231-8 D '14

New concrete arch viaduct of the Philadelphia, Baltimore & Washington R. R. over Gwynns Falls, Baltimore. il plans map Ry R 56:345-8 Mr 13 '15

Ornamental and cheap concrete bridge, Cañon City, Colo. R. C. Hardman. il diags Eng N 74:241-2 Ag 5 '15

Ornamental bridge at Akron built of slag concrete. il Eng N 74:769-70 O 21 '15

Ornamental concrete elevated railway, New York city, M. E. Griest. il diags Eng N 74: 913-18 N 11 '15

Pennsylvania's concrete bridge over the Susquehanna. diags Eng Rec 71:326 Mr 13 '15

Progress on Summit cut-off of the Lackawanna. il diags Ry Age 58:235-9 F 5 '15

Reinforced-concrete arch bridge has stone facing. il Eng Rec 72:164-5 Ag 7 '15

Reinforced-concrete bridge with cantilever abutments: overhead crossing at Hallstead, Pa. diags Eng Rec 70:622-3 D 5 '14

Reinforced concrete bridges. Ry Age 59:761-2 O 22 '15

O 22'15
Reinforced concrete bridges along the Columbia highway in Oregon. K. P. Billner. il diags Eng & Contr 43:121-3 F 10'15; Same. Eng N 72:1145-8 D 10'14
Reinforced-concrete cantilever bridges. A. B. Hill; L. F. Smith; F. H. Frankland. il Eng N 73:790-2 Ap 22'15
Reinforced-concrete highway arch for grade separation. diags Eng Rec 70:703-4 D 26'14
Reinforced-concrete sewer viaduct. E. D. Gilman. il diag Eng N 73:1191 Je 17'15
Reinforced-concrete viaduct at St. Louis, Mo. C: W. Martin. il diags Eng N 74:725-7 O
14'15
San Francisco—Mission street viaduct. A. J.

14 '15
San Francisco—Mission street viaduct. A. J. Cleary. il plan Eng N 73:319-20 F 18 '15
Surface treatment of concrete bridges for rail-way and highway traffic. A. M. Wolf. il Concrete Cem 6:169-75 Ap '15
Test of full-size reinforced-concrete bridge slab. Eng Rec 71:26 Ja 2 '15
Tests of reinforced concrete structures on the Great Central railway: abstract. J. B. Hall. Am Soc M E J 37:122-3 F '15
Track depression at Mattoon: Illinois Central R. R. il diag plan Eng N 74:110-12 Jl 15 '15
Track depression at Minneapolis. diags Eng N 73:516-17 Mr 18 '15
Tunkhannock viaduct nearing completion. il Eng Rec 72:42-3 Jl 10 '15
Twelfth street double-deck viaduct at Kansas

Twelfth street double-deck viaduct at Kansas City. il diags Eng N 73:10-15 Ja 7 '15

Unit-construction system applied to a threemile concrete viaduct to reduce the cost, il diags plan Eng Rec 72:248-51 Ag 28 '15

See also Trestles, Concrete

## Patents

Six concrete-bridge patents void on broad grounds, R. E. Lewis, diags Eng N 74:1094-5 D 2 '15

Bridges, Iron and steel Allowing for impact in bridge calculations. J. D. W. Ball. diags Engineer 120:151-3 Ag

13 '15
Alloy steels economical for long-span bridges.
J. A. L. Waddell. Eng Rec 72:386-7 S 25 '15
Comparison of carbon steel and high-alloy
steels for bridges. J. A. L. Waddell. Eng &
Contr 41:685-88; Discussion. 41:688-90; 42:
243-4, 495-6 Je 17, S 9, N 25 '14
Design of the main shoes of the new Quebec
bridge. il diags Engineer 118:527-8 D 4 '14
Details of main span of Detroit-Superior
bridge at Cleveland. diags Eng Rec 70:640-1
D 12 '14
Details of steel bridges over reciliary

D 12 '14
Deterioration of steel bridges over railway tracks at Buffalo, R. J. Reidpath, il diags Eng N 73:1144-7 Je 10 '15
Development of the Sudan, il map plans diags Engineer 119:271-4 Mr 19 '15
Difficult grade crossing elimination in Albany, N. Y. il diags plan Ry Age 59:961-3 N 19 '15
Erecting the largest steel arch bridge in existence, Hell Gate, New York, il Sci Am 113:
193 S 4 '15
Erection at Hell Cott.

193 S 4 '15
Erection at Hell Gate arch checks calculations. il Eng Rec 72:220-1 Ag 21 '15
Erection of new Quebec bridge. H. P. Borden. il Eng Rec 71:80-1 Ja 16 '15
Erection of steel arch span, Detroit-Superior viaduct. il diags Eng N 74:366-7 Ag 19 '15
Erection of the world's greatest steel bridge at Hell Gate. il Iron Tr R 57:944-5 N 11 '15
Fabricating steelwork for the Hell Gate arch. il Eng Rec 70:684-6 D 26 '14
Features of a unique bridge over the Bow river in Alberta, Canada. il Eng & Contr 44: 53 Jl 21 '15
Hardinge bridge over the lower Ganges in India. F. C. Coleman, il diags Eng N 73:1160-4 Je 17 '15
Hell-Gate arch bridge and the New York Con-

4 Je 17 '15 Hell-Gate arch bridge and the New York Con-necting railroad, il diag map Ry R 57:453-61

Hell Gate bridge in the shop. il Eng N 72:1116-18 D 3 '14

Hell Gate bridge in the world; Hell Gate bridge it Sci Am 113:340-1+ O 16'15 Long-span continuous-truss bridge over the Ohio, diags Eng N 74:61-6 Jl 8'15 Longest simple truss span in world to be erected over Ohio river at Metropolis, diag Eng Rec 72:53-4 Jl 10'15; Abstract (Silicon Eng M 49:913') Eng Rec 72:53-4 Jl 10 '15; Abstract (Silicon steel for bridge construction). Eng M 49:913 S '15

Scient for bridge construction). Eng M 49:313
New bridge across the Missisppi river at Keckuk. plans Ry Age 58:200 Ja 29 '15
New double-deck bridge over the Missouri river at Kansas City. diag map Ry Age 59: 284 Ag 13 '15
New methods evolved in building world's largest bridge; Quebec erection. il Eng Rec 72:96-100 Jl 24 '15
977-ft. Hell Gate bridge becomes an arch, il Eng N 74:708-9 O 7 '15
Notable structures on the Spokane-Ayer cutoff. il diag Ry Age 58:623-6 Mr 19 '15
Ohio river bridge for the C., B. & Q. R. R. diag Eng N 74:230-2 Jl 29 '15
Pacific highway interstate bridge over the Columbia river and its approaches. E. E. Howard. diags Eng & Contr 43:540-3 Je 16 '15

Pacific highway interstate bridge over the Columbia river at Portland, Oregon. Good Roads n s 10:61-2 Jl 10 '15 Pacific highway interstate bridge over the Columbia river, Portland, Ore. E. E. Howard, diags Eng N 73:1218-21 Je 24 '15

Pacific highway interstate bridge; special pier and floor design feature. diags Eng Rec 72: 18-20 Jl 3 '15

Progress of the new Quebec bridge, il plan Engineer 119:101-3 Ja 29 '15

Progress on Hell Gate bridge, New York city. il Eng N 74:236-7 Jl 29 '15

Quebec bridge work in 1915, il Eng N 74:473-5 S 2 '15

Recent cast-iron bridge decorations. il Eng N 73:270-1 F 11 '15

Record set for weight of steel erected in one day at Randall's island on Hell Gate bridge approach, il Eng Rec 71:399-400 Mr 27 '15

Bridges, Iron and steel—Continued
St. Louis municipal bridge east approach a steel viaduct nearly 3 miles long, diags Eng Rec 72:634-5 N 20 '15
Steel arch bridge on curved gradient in the Bietsch valley, il diags Engineer 118:549-50 D 11 '14; Same cond. Eng M 48:750-1 F '15
Steel bridge standards of the Iowa highway commission. E. F. Kelley, diags Eng Rec 70: 631-2 D 12 '14
Steel structural engineering. E. Marburg. Eng Rec 71:7-10 Ja 2 '15

Rec 71:7-10 Ja 2 '15

Three-mile approach viaduct, St. Louis municipal bridge, diag Eng N 71:141-5 S 2 '15

Work on the new Quebec bridge during the first erection season. H. P. Borden, il Eng N 73:1-4 Ja 7 '15

## Protection

Gunite concrete encasement. diags Ry R 56: 129-30 Ja 23

129-30 Ja 23 15 Protection of metal structures; with discussion, F: H. Fay, il diags Eng Soc W Pa 31: 115-93 Mr '15; Excerpt, Ry R 57:154 Jl 31 '15 Waterproofing solid steel-floor bridges; Waterproofing solid steel-floor bridges; abstract. S: T. Wagner. Eng & Contr 43:79-81 Ja 27 '15; diags Ry R 56:273-7 F 27 '15; Discussion. A. W. Carpenter. Ry R 56:557-8 Ap 24 '15

Bridges, Lift

ridges, Lift
Design and erection of the Pennsylvania lift
bridge no. 458 over the south branch of the
Chicago river. W. L. Smith and W. W.
Priest. il diags W Soc E J 20:478-500 My '15;
Same. Ry R 56:519-28 Ap 17 '15; Same cond.
Eng Rec 71:611-13 My 15 '15
Direct-lift span provides 55-foot clearance
over Louisville and Portland canal. il Eng
Rec 72:199-200 Ag 14 '15
Erecting a lever lift bridge. il Eng N 74:123-4

Lift bridge constructed on 4 per cent. grade in Fairport, N. Y. C: R. Waters. il Eng N in Fairport, N. Y. 73:705-6 Ap 15 '15

73:705-6 Ap 15 15
Lift spans over Arkansas river designed for possible shifting of channel, il diags Eng Rec 72:667-70 N 27 '15
Pacific highway interstate bridge over the Columbia river, E. E. Howard, diags Eng N 73:1218-21 Je 24 '15

Pacific highway interstate bridge over the Columbia river and its approaches. E. E. Howard, diags Eng & Contr 43:540-3 Je 16

Special pier and floor design feature Pacific highway interstate bridge, diags Eng Rec 72:18-20 Jl 3 '15 Two large lift bridges at Chicago, diags Engi-neer 120:339-40 O 8 '15

See also Bridges, Bascule

Bridges, Military. See Military bridges

Bridges, Movable. See Bridges, Bascule; Bridges, Lift; Drawbridges

Bridges, Pontoon. See Pontoon bridges

Bridges, Railroad

Allowing for impact in bridge calculations. J. D. W. Ball. diags Engineer 120:151-3 Ag J. D. 13 '15

13 '15
Bridge and building association, 25th annual convention. Ry Age 59:753-64 O 22 '15
Bridge work of the C. M. & St. P. Ry. il plan Ry R 56:335-8 Mr 13 '15
Building concrete caissons in the Platte river.
J. H. Merriam, il diags Ry Age 59:383-6 Ag 27 '15

21 15 Candian Pacific draw span over the Lachine canal. il Ry Age 59:239 Ag 6 '15 Chart of equivalent uniform loads for railway bridges. D. B. Steinman. Eng N 73:780-2 Ap 22 '15

22 15 Chesapeake & Ohio Northern railway bridge over the Ohio river at Sciotoville, O. diags Eng & Contr 44:84-5 Ag 4 '15 Completing the summit cut-off of the Lacka-wanna. il Ry Age 59:809-10 O 29 '15

Concrete pier work on the Cumberland valley R. R. bridge over the Potomac. il Eng N 73: 124-5 Ja 21 '15

Concrete viaducts on the Pennsylvania railroad. D. A. Willey. il Sci Am S 79:24 Ja 9 '15 Construction of the Gwynns Falls arch bridge, il diag Ry Age 57:1037-40 D 4 '14

Construction of the Hallstead cut-off, D. L. & W. R. R.: Tunkhannock viaduct and Martin's Creek viaduct. il diags Ry R 56:143-8 Ja 30 '15

Lin's Creek viaduct. il diags Ry R 56:143-8
Ja 30 '15
Data on reinforced concrete railroad bridges
and extent to which such bridges are used,
diags plan Eng & Contr 43:29-32 Ja 13 '15
Design and construction of the Langwies viaduct—Chur-Arosa R. R., Langwies, Switzerland, A. M., Wolfe, il diags Concrete Cem
6:239-45 My '15
Design and erection of the Pennsylvania lift
bridge no. 458 over the south branch of the
Chicago river, W. L., Smith and W. W.
Priest, il diags W Soc E J 20:478-500 My '15;
Same, Ry R 56:519-28 Ap 17 '15; Same cond.
Eng Rec 71:611-13 My 15 '15
Design, construction and detailed costs of the
Richelieu river bridge, Lacolle Junction,
Quebec, il diags Eng & Contr 42:542-6, 585-5
D 9, 23 '14
Elastic curve applied to the design of the
Sciotoville bridge, D. B. Steinman, Eng Rec

Quebec, il diags Eng & Contr 42:342-6, 585-5 D 9, 23 '14
Elastic curve applied to the design of the Sciotoville bridge, D. B. Steinman, Eng Rec 72:258-60 Ag 28 '15
Erecting railroad viaduct superstructure, i diags Eng Rec 70:668-70 D 19 '14
Features of the Tunkhannock creek viaduct recently completed at Nicholson, Pa. il Eng & Contr 44:389-90 N 17 '15
First French bridge built in war time. W. S Hiatt, il Ry Age 59:564 S 24 '15
Lake Erie & Eastern R. R.; concrete arch at Mahoning avenue, Youngstown, il plan man Ry R 57:132-7 Jl 31 '15
Long-span continuous-truss bridge over the Ohic, diags Eng N 74:64-6 Jl 8 '15
Longest riveted simple trusses erected around old bridge by cantilever method at Pitts burgh, il diags Eng Rec 72:82-4 Jl 17 '15
Longest simple truss span in world to be erected over Ohio river at Metropolis, diag Eng Rec 72:53-4 Jl 10 '15; Abstract (Silicon steel for bridge construction). Eng M 49:91 S '15
Lower Ganges bridge of the Eastern Benga

S '15
Lower Ganges bridge of the Eastern Benga
Ry, il Ry R 56:664-5 My 15 '15
Metropolis bridge over the Ohio river, diag:
Ry Age 59:160 Jl 23 '15
New bridge across the Missouri river at Sib
ley, Mo. il diags Ry Age 59:13-16 Jl 2 '15
New bridge of the Chicago, Burlington &
Quincy R. R. over the Missouri river a
Kansas City, Mo. diag Eng & Contr 44:17
S 1 '15

S 1 15 New bridge over the Thames river, N. Y. N. H. & H. R. R. Ry R 57:682-3 N 27 '15 New B. R. & P. structure across Alleghen; river at Riverside, N. Y. il diag Ry Age 58 845-6 Ap 16 '15

845-6 Ap 16 '15 New Canada-New England railroad link completed; Van Buren bridge route. maps En. Rec 71:559 My 1 '15 New concrete arch viaduct of the Philadel phia, Baltimore & Washington R. R. ove Gwynns Falls, Baltimore. il plans map Ry 1 56:345-8 Mr 13 '15

56:345-8 Mr 13 '15 Notable structures on the Spokane-Ayer cut off. il diag Ry Age 58:623-6 Mr 19 '15 Ohio river bridge for the C., B. & Q. R. E. diag Eng N 74:230-2 Jl 29 '15 Ohio river bridge to contain longest riveted truss spans in America. diags Eng Rec 71 799-800 Je 26 '15 Overloads allowed in operating railroabridges. J. E. Greiner. Eng Rec 72:387 S 2 '15

Pennsylvania's concrete bridge over the Susquehanna, diags Eng Rec 71:326 Mr 13 '1 Piecemeal erection of a bridge on the Bosto & Maine R. R. K. W. Lemcke, il diags En N 74:1057-9 D 2 '15

Pontoon railroad bridge across the Panam canal, diags Ry R 56:82-4 Ja 16 '15

Practical bridge erection and maintenanc methods. il diags Ry Age 58:1077-82; 59:347 51 My 21, Ag 20 '15

Rail-end connections for bascule bridges. diag Eng N 73:1216-17 Je 24 '15
Rebuilding the Muskingum bridge near Coshocton, il diags Eng N 74:105-8 Jl 15 '15

Reinforced-concrete bridge with cantileve abutments: overhead crossing at Hallstead Pa. diags Eng Rec 70:622-3 D 5 '14

dges, Railroad —Continucd Replacing a large truss bridge by lateral movement. J. C. Bland and J: Miller, il Ry Age 58:460-2 Mr 12 '15 olid deck trestles and bridges on the Illinois Central, il diags Ry Age 59:279-80 Ag 13 '15 cubstructure for new Memphis bridge, M. B. Case, il Eng Rec 71:518-20 Ap 24 '15; Same, Ry Age 58:877-81 Ap 23 '15; Same cond. Ry R 56:554-6 Ap 24 '15; Same cond. Eng N 73:792-3 Ap 22 '15 'rack elevation at Lynn, Mass. C: B. Breed, il diags plans Eng N 74:533-7 S 16 '15 'unkhannock viaduct nearing completion, il Eng Rec 72:42-3 Jl 10 '15 'laduct construction on the Kansas City terminal, A. R. Eitzen, il diag Ry Age 58:397-400 Mr 5 '15 'lind stresses in railroad bridges, R. Fleming, Eng N 73:252-6 F 11 '15 'Scc also' Bridges, Bascule; Elevated rail-

8ce also Bridges, Bascule; Elevated rail-roads; Pontoon bridges; Railroads—Track elevation

dges, Rolling lift. See Bridges, Bascule

dges, Stone roposed centering for large-span stone bridges, S. Berg, diags Engineer 119:472-4, 521-3, 569-70 My 14, 28, Je 11 '15

dges, Suspension Vooden suspension foot bridge. il Eng & Min J 98:1000 D 5 '14

dges, Tubular stimate for a tubular bridge for the Mexican Ry. Eng N 73:405 F 25 '15

ahtness

gntness rightness-difference sensibility of the eye under various brightness of test-fields and surroundings. P. W. Cobb. J Fr Inst 180: 235-7 Ag '15 fficiency of the eye under different conditions of lighting; the effect of varying the distribution factors and intensity. C. E. Ferree and G. Rand. il Illum Eng Soc 10:407-47 no 6 '15 urther experiments on the efficiency the

47 no 6 '15
urther experiments on the efficiency of the eve under different conditions of lighting. C. E. Ferree and G. Rand. il plan Illum Eng Soc 10:448-501 no 6 '15
ood and bad in recent lighting development. J. R. Cravath. il Elec W 66:519-20 S 4 '15
lethods of expressing brightness. J. R. Cravath. Elec W 64:1157-8 D 12 '14
ptical properties of diffusing media. Illum Eng Soc 10:353-78 no 5 '15
clanning of lighting installations. R. F. Pierce. il Am Gas Light J 103:321-2 N 22 '15
Troposed unit of brightness. Elec W 65:715
Mr 20 '15
ettinal sensibilities related to illuminating engineering. P. G. Nutting. J Fr Inst 180:482-4
O '15
mit of brightness. H. E. Ives. Elec W 65:460

nit of brightness. H. E. Ives. Elec W 65:460 F 20 '15 nits of brightness. J. R. Cravath. Elec W 66:60-1 Jl 10 '15

See also Glare

riquets as fuel for house heating boilers. D. T. Randall, il Metal Work 83:847-9 Je 11

'15
ritish Portland cement making machinery;
briquetting presses. il diags Engineer 120:
148-51 Ag 13 '15
uel briquetting. Colliery 36:45 Ag '15
ecent developments in coal briquetting. C: T.
Malcolmson. il Am Inst Min E Bul 98:271-89
F '15; Discussion. 101:1143-7 My '15

quets (iron) Friquettes in blast-furnace practice. M. Zill-gen. Iron Age 94:1394-5 D 17'14

tannia Iritannia linings for Hardinge mills. G: E. Collins. Met & Chem Eng 13:650-1 O 1 '15

tannic (steamship) Thite Star liner Britannic. il Int Marine Eng 19:556-9 D'14

tish association for the advancement of science ith annual meeting, Manchester, Sept. 7-11. Power 42:529-30 O 12 '15 [anchester meeting. Engineer 120:268-70, 292-3, 357-8 S 17-24, O 15 '15

British Columbia

See also Mines and mineral resources— British Columbia

Acquiring placer-mining claims in British Co-lumbia. J. A. Macdonald. diag Eng & Min J 100:757-9 N 6 '15

British engineers' association 3d meeting, Manchester. Engineer 118:578-9 D 18 '14

Broaching

Broaching connecting-rods, il Mach 21:482 F

Broaching operation done in the punch press, F. K. Hudson, diags Mach 21:493-4 F '15 75-ton self-contained hydraulic broaching and forcing press, il Ind Eng 14:401 O '14

Bromal

Action of chloral, bromal and benzaldehyde on the polycyclic hydrocarbons in the presence of aluminium chloride. G. B. Frankforter and W. Kritchevsky. Am Chem Soc J 37:385-92 W. K F '15

Bromides

Detection of bromides in the presence of thio-cyanates, cyanides and ferrocyanides. L: J. Curtman and A. G. Wikoff, Am Chem Soc J 37:298-301 F '15

Bromoacetates

Salts of the halogenoacetic acids. W. G. Bateman and D. B. Conrad, Am Chem Soc J 37: 2553-60 N '15

Bronze

Applications of metallic cobalt: experiments conducted with cobalt and copper alloys, D. B. Browne. Metal Ind n s 12:509-10 D '14 Art of casting from life. W. Bilz. il Metal Ind n s 13:333-4 Ag '15 Brass and bronze—offsprings of copper. J. E: Schipper. il map Automobile 33:315-19, 368-70, 412-13 Ag 19-S 2 '15 Bronze castings as a substitute for steel parts. Met & Chem Eng 13:193-4 Mr '15 Composition of manganese bronze. Foundry 43:315 Ag '15 Flexible bronze tubing of the Partridge Island pipe line. il diag map Eng N 73:1167-8 Je 17 '15

How titanium-aluminum bronze is produced. C. Vickers, il Foundry 43:273-8 Jl '15 Manganese-bronze, J. B. Rhodes, Metal Ind n s 13:462 N '15 Manufacture and uses of wrought manganese bronze, J. L. Jones, Metal Ind n s 13:410-12

O '15
Microstructural changes accompanying the annealing of bronze. H: S. Rawdon. J Fr Inst 180:607-8 N '15
Properties of aluminum bronze alloys. W. M. Corse. il Foundry 43:459-60 N '15
Specifications for government bronze. diags Foundry 43:260 Jl '15; Same. Metal Ind n s 13:273 Jl '15

Status of the bronze troubles on the Catskill aqueduct. A. D. Flinn. Eng N 74:572 S 16 '15 Titan bronze. il Met & Chem Eng 13:645-6 S 15 '15

Titanium aluminum bronze. W. M. Corse and C: Vickers. Metal Ind n s 13:190-1 My '15 Titanium-aluminium bronze castings. W. M. Corse. Met & Chem Eng 13:511-12 Ag '15 What is phosphor-bronze? Foundry 43:69-70 F

Bronzes

Bronze in history-making: an ancient figured bronze door reveals the aerial-navigation en-gineering of antiquity, L. Lodian, il Metal Ind n s 13:51-3 F '15 Molding and casting a bronze monument, W. N. Nelly, il Metal Ind n s 13:93-4 Mr '15

Bronzing

per. T. I Baker. Metal Ind n s 13:464-5 N '15 (to be cont)

Brooklyn, New York

Rapid transit

Brooklyn rapid transit. Ry Age 59:223-4 Ag 6

Traffic congestion problem. W. H. Messenger. il Munic Eng 48:19-25 Ja '15

Brooklyn, New York-Continued

Sanitary affairs

Experimental plant for treating sewage. G: T. Hammond, il Munic Eng 47:427-36 D '14

Water supply

Works for the collection of a ground water supply at Brooklyn. W: F. Laase. Eng & Contr 44:225 S 22 '15

Brooklyn bridge Six etchings

Six etchings of Brooklyn bridge, by H. De Ville; text by M. Stapley. Arch Rec 38:583-91 N '15

Brooklyn children's museum Children's museum. Sci Am 112:250 Mr 13 '15

Brooklyn rapid transit company
Annual report. Ry Age 59:259-62 Ag 6 '15
Commission report of service—company's reply. Elec Ry J 45:108-9 Ja 9 '15
Modern railway school. il plans Elec Ry J 46: 344-53 Ag 28 '15

Brooms

Manufacturing brooms, B. N. I Age (Mech ed) 89:407-8 Ag '15 Lewis, il Ry

Brownian movements

Motion films of molecular movements. il Elec W 66:708 S 25 '15

Brushes (electric machinery)
Brush-holder practice for single-phase motors.
R. R. Potter, il diag Elec Ry J 46:408-9 S 4

Graphite brushes. Colliery 36:167-8 O '15

Preventing burning of the top of brushes, R. H. Parsons, diags Elec Ry J 46:917-18 O

Schweitzer multiplex brush for commutators and collector rings. il Elec R & W Elec'n 67:382 Ag 28 '15

Troubles encountered in the operation of carbon brushes in direct-current generators and motors. E. H. Martindale. il Am Inst E E Pro 34:373-84 Mr '15; Same cond. Power 41:558-9 Ap 20 '15; Same cond. Engineer 119:468-9 My 7 '15; Same cond. (Causes of poor commutation and remedies). Elec W 65:863-4 Ap 3 '15; Discussion. Am Inst E E Pro 34:2966-74 D '15

Bubbling fountains. See Drinking fountains

Brownhoist-Shnable patent drag-line bucket, il Ry R 57:249-50 Ag 21 '15; Eng & Contr 43: 580-1 Je 30 '15; Ry Age 59:125-6 Jl 16 '15

Dippers for steam shovels and dredges. Eng N 73:80 Ja 14 '15

N. P. pump bucket. Engineer 118:506 N 27 '14

Buckeye-mobile. See Locomobiles

Budgets

Annual budget. W: T. Childs. Munic J 39: 545-7 O 7 '15

Rational budget making. Munic J 39:695-7 N

Buenos Aires Water supply and drainage in Argentina, A. Dale, il Metal Work 84:103-6 Jl 23 '15

Buffalo, New York

Bridges

Design and construction of the substructure of the Buffalo river lift bridge. il diags Eng & Contr 44:362-5 N 10 '15

Deterioration of steel bridges over railway tracks at Buffalo. R. J. Reidpath, il diags Eng N 73:1144-7 Je 10 '15

Industries and resources

Buffalo and Niagara Falls and their industries. il Am Soc M E J 37:vi-x My '15

Railroads

Lackawanna passenger terminal at Buffalo. maps Eng Rec 71:334-6 Mr 13 '15

Proposed passenger terminals at Buffalo, il plan Ry R 56:338-40 Mr 13 '15

Rapid transit

Buffalo's railway facilities; sketch of past and present conditions. E. J. Dickson. Elec Ry J 45:135-6 Ja 16 '15

Sanitary affairs

Buffalo sewage disposal and water-supply i relation to the pollution of the Great Lakes Eng N 73:8-9 Ja 7 '15

Water supply

Use of liquid chlorine at Buffalo water-work intake. H. F. Wagner. il diags Eng N 73 856-7 My 6 '15

Buffalo, Rochester & Pittsburgh railway 30th annual report. map Ry Age 59:310-13 370-2 Ag 20 '15

Buffet cars

Baggage-buffet cars for the Union Pacific F R. diags Ry R 56:9-10 Ja 2 '15 Café day coach, il Ry Age 59:57-8 Jl 9 '15

Buffing. See Grinding and polishing

Builders' exchanges
Convention of National association of build
ers' exchanges. Bldg Age 37:33-7 Mr '15
Meeting of Ohio builders' exchanges. Bldg Ag
37:47-9 Mr '15

Meeting of Ohio builders' exchanges. Bldg Ag 37:47-9 Mr '15

Building
Building methods on the Pacific coast. il Bld Age 37:59-60 D '15
Chicago's 1914 progress in building. il Bld; Age 37:46-8 F '15
Construction management. S. E. Thompso and W: O. Lichtner, il diags W Soc E J 20 109-29 F '15; Same cond. Eng & Contr 43 428-32 My 12 '15; Discussion. W Soc E J 20 129-51 F '15
Co-operation in small building development P. H. Bosworth. Concrete Cem 6:42 Ja '15
Electric drive in building construction. il Ele W 65:675 Mr 13 '15
Erecting a building under a tent in winter. Eng N 73:394 F 25 '15
Fastenings for stone or steel. H. M. Schember il diags Bldg Age 37:69-70 F '15
Heating trade wants six-inch studs. Bldg Ag 37:61 Jl '15
How a large truss roof was raised. J. F. Ho bart. il Bldg Age 37:26-30 My '15
Notable church remodeling operation. il Bld; Age 37:19-22 Ag '15
Panama Pacific international exposition: large scale time-limited construction problems E. P. Lesley. plan Iron Age 95:79-81 Ja '15; Same cond. Eng M 48:891-3 Mr '15
Planning for daylight and sunlight in build ings; with discussion. L. B. Marks and J. E Woodwell. bibliog il diags Illum Eng So 9:643-86 no 7 '14
Profitable specialty: building loss adjuster fo fire insurance companies. G. D. Crain, jr Bldg Age 37:61-2 F '15
Remodeling a frame station building. H. H See. il plans Bldg Age 37:33-6 Je '15

Am 8 79:30-1 F 6 '15 Remodeling a frame station building. H. H See, il plans Bldg Age 37:33-6 Je '15 Residence construction in Indiana. J. F. Ho bart, il plans Bldg Age 37:47-52 O '15 Special details in reinforced concrete and stee building construction. L: W. Bruck, Eng & Contr 44:143-4 Ag 25 '15

Contr 44:143-4 Ag 25 '15

See also Acoustics, Architectural; Arches Architecture; Armories; Brick construction Bricklaying; Bridges; Building materials Building stones; Buildings; Carpentry; Cellars; Chimneys; China closets; Concrete construction; Cribs, Concrete; Engineering Factories; Fireproof construction; Floors Foundation soils; Foundations; Framing fouilding); Girders; Graphic statics; Grouting; Heating; Hot water supply; Masonry Office buildings; Partitions; Piers; Plaster and plastering; Plumbing; Roofs; Scaffolding; Shoring and underpinning; Stairways Steel construction; Strains and stresses Strength of materials; Trusses; Ventilation; Walls; Windows

Accounting

Accounts for material on engineering con-struction. L. H. Allen. J Account 19:352-8 My '15

Building construction costs, W. W. Crosby, Textile World 48:577-8 Mr '15 Cost of schoolhouse construction, with a pro-posed unit based on cubical contents. E: C. Baldwin. Heat & Ven 12:22-7 Je '15

Building-Cost -Cantinued

Design, construction and detailed labor costs of car shops for Omaha & Council Bluffs street railway co., Omaha, Neb. W. L. Fulton. diag plans Eng & Contr 44:264-6 0 6 '15 Estimating the cost of mill buildings. C: F. Dingman. Eng & Contr 44:185 S 8 '15 Figures of comparative building costs. Bldg Age 37:31-2 Je '15 Labor costs in building construction. E. W. Robinson. il diag plan Bldg Age 37:31-4 S

Modern schoolhouse; cubage and cost. W. H. Kilham. il plans Brickb 24:107-10 My '15 Why this is the time to build. il Iron Tr R 56:511-13 Mr 11 '15

See also Bridges-Cost; Concrete construction-Cost

#### Estimates

Checking lists for estimators on building work L. A. Waterbury. Eng & Contr 42:364-6 O 14'14

Quantity system of estimating. D. S. Ballantine. Bldg Age 37:41 Jl '15
Suggestions for estimating mill work. Bldg Age 37:35-6 N '15

## Materials

See Building materials

## Tables, calculations, etc.

Facilitating timber design; tables and diagrams used in connection with the structural work on the New York state building, Panama-Pacific exposition. S. Diamant. Eng Rec 71:296-7 Mr 6 '15

Tables for determining the bending moments and shears in simple beams and in beams fixed at one and both ends. S. M. Cotten. Eng & Contr 43:335-40 Ap 14 '15

#### India

British India; building construction. U S Sp Cons Rep 72:169-75 '15 Building a genuine Indian bungalow. A. R. Sarath-Roy. Bldg Age 37:65-6 Je '15

Building contracts

Arbitration provision for building contracts.
Arbitration provision for building contracts.
E. T. Thurston. Eng & Contr 43:199 Mr 3 '15
Change of site does not affect contract. W: B.
King. Eng Rec 71:332 Mr 13 '15
Contradicting written agreements. A. L. H.
Street. Bldg Age 37:45-6 Je '15
Discussion of some legal principles of interest to engineers. W: L. Bowman. Eng & Contr 42:552-4 D 16 '14
Does millwork include glass? A. L. H. Street.
Bldg Age 37:32 Ja '15
How courts read building contracts. A. L. H.
Street. Bldg Age 37:63-4 Jl '15
Law points in building contracts. A. L. H.
Street. Bldg Age 37:49-50 F '15
Law points in building contracts. A. L. H.
Street. Bldg Age 37:51-2 Ag '15
New form of government contract. R: D.
Micou. Eng N 74:109 Jl 15 '15
New standard documents. W: S. Parker. Am
Inst Arch J 3:300-3, 346-51, 388-92, 439-43
Jl-O '15
Problem of extras. Concrete Cem 5:255 D '14

Problem of extras. Concrete Cem 5:255 D '14 Should details be furnished before a contract is signed? G. A. Wright. Bldg Age 37:66 N '15

Standard documents of the American institute of architects; with forms. Am Inst Arch J 3:sup1-7 F '15

See also Bridge contracts

uilding data league Organization. Elec W 66:39 Jl 3 '15; Heat & Ven 12:33 Jl '15; Eng N 74:281 Ag 5 '15 Building

Building failures
Unriveted steelwork collapses in Toledo gale.
il Eng Rec 71:507-8 Ap 17 '15
See also Bridge failures; Concrete construction—Failures; Dam failures

Building laws
Architects as independent contractors. A. L.
H. Street. Bldg Age 37:64-5 N '15

Architects versus engineers; Illinois engineers win fight for legal recognition. Assn Eng Soc J 54:277-99 Je '15

Building-area, height and other limitations to use of private city property compiled. N. P. Lewis. Eng Rec 72:597-8 N 13 '15
Building code regulation of concrete block and other building units. H. Whipple. Concrete Cem 6:181-4 Ap '15
Chicago flat-slab ordinance; discussion. Eng N 72:1274-7 D '24 '14
Cleveland bases stairway regulations on studies. Eng Rec 72:260 Ag 28 '15
Community stupidity; how real-estate promotion creates congestion and reduces values. F: L. Ackerman. plans Am Inst Arch J 3: 193-7 My '15
Discussion of the Indiana housing law. A. F. Wickes. Am Inst Arch J 3:187-8 Ap '15
Discussion of the Indiana housing code. Eng Rec 70:626 D 5 '14
How Cleveland fixes sizes of courts and yards. plan Eng Rec 71:614 My 15 '15
New ruling on reinforced concrete flat slab construction by building department of Chicago. Eng & Contr 42:330 O 7 '14
New York's revised building code. Bldg Age 37:31-2 Ag; 59-60 O '15
Ordinance on fire safeguards. Eng N 74:429-30 Ag 26 '15
Planning for daylight and sunlight in buildings with table of building height limits. I. P.

Ordinance on his safeguards. Eng N 74:429-30 Ag 26 '15
Planning for daylight and sunlight in buildings with table of building height limits. L. B. Marks and J. E. Woodwell. Illum Eng Soe 9:645-7, 667 no 7 '14
Proposed state building code for Illinois. Eng & Contr 42:451 N 11 '14
Regulation of concrete block manufacture and use. Concrete Cem 6:208-9 Ap '15
Résumé of plumbing requirements of New York, Chicago, Philadelphia, and Boston. C: A. Whittemore. Brickb 24:197-200 Ag '15
Shingle roofs and fire limits. W. B. Conant. Munic J 38:189-90 F 11 '15
Theory and practice in writing building laws. J: A. Ferguson. Eng Soc W Pa 30:130-66 Mr '14; Excerpts, Eng & Contr 42:222-5, 265-6 S 2, 16 '14; Discussion. Eng Soc W Pa 30:166-90 Mr '14
Wind-bracing requirements in municipal building codes. R. Fleming. Eng N 73:485-7 Mr 11 '15

See also Fireproof construction; Garages— Laws and regulations; Heating—Laws and regulations; Plumbing laws and regulations

Building materials

Air permeability of building materials; abstracts. H. von Thielmann. Am Soc M E J 37:477-8 Ag '15; Heat & Ven 12:44-5 S '15. American society for testing materials holds annual meeting in Atlantic City. Eng Rec

72:25-9 Jl 3 '15
Establishment of a standard for transmission losses from buildings of all constructions. R. P. Bolton. Heat & Ven 12:19-23 Jl '15; Same. Dom Eng 73:264-6 N 27 '15; Same. cond. Metal Work 84:373+ S 17 '15
Heat losses by transmission through various building materials. L. A: Harding. Am Soc Heat & V E 19:208-18 '13
Laboratory freezing tests. H. Perrine. diags Concrete Cem 5:256-7 D '14
See also Achestory English: Ruilding stones.

See also Asbestos; Bricks; Building stones; Cement; Concrete; Concrete, Reinforced; Concrete blocks; Concrete bricks; Concrete stone; Fire resisting materials; Fireproof construction; Glass; Hollow tile; Iron; Lime; Mortar; Plaster and plastering; Sheet metal; Steel, Structural; Strength of materials; Stucco; Tiles; Timber; Wood

Building moving
Fifteen hundred-ton country club moved 1200
feet, ii Eng Rec 71:694 My 29 '15
Floating a clubhouse to a new site. ii Eng N
73:589-90 Mr 25 '15
Heavy car dumping plant moved 214 feet in
2½ days. ii diag Eng Rec 71:49 Ja 9 '15
Large steel tanks cut in two for removal on
barge. il Eng Rec 71:278 F 27 '15
Moving large steel grain tanks. il Sci Am 113:
185 Ag 28 '15

Moving reinforced-concrete hotel in San Fran-cisco. A. D. Phares, il Eng Rec 71:289-90 Mr

Notable church remodeling operation, il Bldg Age 37:19-22 Ag '15 See also Bridge moving

Building stones
Stone production in the United States, 19011913. Eng Rec 70:642 D 12 '14
Testing of building stone in Canada. Engineer 120:18 J1 2 '15

See als; Limestone

Building trades

Building operations in 1914, Bldg Age 37:37 O

Changes in the building business. M. C. Tuttle. Eng N 73:1024-5 My 27 '15 Making the building business profitable. Bldg Age 37:22, 24 Ap '15 Review of building situation in 1914. Bldg Age 37:77-8 F '15.

Should the builder carry a stock? G. D. Crain, ir. il Bldg Age 37:57-8 Ap '15

Buildings Buildings-factor costs. H. L. Green. Eng M 48:407-10 D'14; Same. Eng & Contr 43:101-2

Electrical construction details of Butler brothers building, Chicago. N. G. Meade. il diags Elec R & W Elec'n 66:1183-90 Je 26

Hill building: Iill building; special design for special il diags plans Eng N 72:1241-8 D 24 '14

See also Association buildings; Bank buildings; College buildings; Engineering buildings; Factories; Hotels; Industrial buildings; Market buildings; Municipal buildings; Office buildings; Printing offices; Railroads—Buildings; Schoolhouses; Theaters; Warehouses

## Cleaning

Removing stains from stonework, Bldg Age 37: 41 My '15

Repair

Preliminary repair work on the Edison concrete buildings, il diags Eng N 73:89-91 Ja 14 '15

Rebuilding Edison's great plant. Sci Am 112: 50 Ja 9 '15

50 Ja 9 '15 Reinforcement for the roof timbers of West-minster Hall, England. F. Baines, Eng &

Reinforcement for the roof timbers of Westminster Hall, England. F. Baines. Eng & Contr 42:172-5 Ag 19 '14
Repair of concrete buildings at Edison plant sets precedents in construction work. il diags Eng Rec 71:503-6 Ap 17 '15
Repairing building supports and foundations with concrete. il Concrete Cem 6:45-6 Ja '15
Restoration of old buildings. W. A. Forsyth, Eng & Contr 44:310 O 20 '15

Buildings, Industrial. See Industrial buildings

Buildings, Portable

Construction of a movable greenhouse, il Bldg Age 37:69-71 Ag '15 Portable buildings of monolithic reinforced concrete, il Eng N 72:1255 D 24 '14

Bulkheads

Sulkheads to retain soft fill. diag Eng N 73: 942-3 My 13 '15

Design suggested for shore-protection works on the New Jersey coast. B. F. Cresson, fr. diags Eng N 73:904-5 My 6 '15; Eng Rec 71: 547-8 My 1 '15

Hunt's Point terminal in New York involves difficult bulkhead construction. il diags map Eng Rec 72:104-6 Jl 24 '15

Movable bulkhead for testing steel pipe line in sections after erection. diags Eng & Contr 44:317 0 20 '15

New coal dock for the Cincinnati Hamilton & Dayton Ry. at Toledo; plan. Ry R 57:237 Ag 21 '15: Same. Eng Rec 72:163 Ag 7 '15

Novel bulkhead for wharves at Jacksonville. H. D. Mendenhall. diags map Eng N 74: 772-4 O 21 '15

Special features in the new intake tunnel at Milwaukee. L. G. Warren. diags Eng N 73: 686-7 Ap 8 '15

Steamship terminal in the Bronx. il diag maps

Steamship terminal in the Bronx. il diag maps Sci Am 112:80-1 Ja 23 '15

Bulkheads, Mine. See Mine bulkheads

Bulkheads (naval architecture). See Naval architecture

Bullets

Bullets of the fighting nations. il Sci Am 112: 400-1 My 1'15 Dum-dum bullets. E: C. Crossman. il Sci Am 112:358 Ap 17'15

High-speed bullets and dumdums. Sci Am §

High-speed bullets and dumdums. Sci Am § 79:304 My 8 '15
How rifle bullets fly, E: C. Crossman, il Sc: Am 113:24+ Jl 3 '15
Making shrapnel bullets. Mach 21:649-50 Ar '15; Same. Sci Am S 80:30 Jl 10 '15
Penetration of bullets. E: C. Crossman, il Sc: Am 113:404+ N 6 '15
Rifle and its bullet, H. L. Heussner, il diags Sci Am S 80:268-9 O 23 '15

See also Projectiles; Shells; Shrapne

Bumped heads. See Boiler heads

Bumping blocks

Bumping posts that do the work demanded diags Eng Rec 72:474 O 16 '15 High concrete bumping blocks; B. & O. R. R diags Eng N 73:619 Ap 1 '15

Bungalows

Building a genuine Indian bungalow. A. R. Sarath-Roy. Bldg Age 37:65-6 Je '15
Bungalow costing \$4000. il diags plans Bldg Age 37:27-30 Ja '15
Bungalow of the California type. il plan Bldg Age 37:53-4 D '15
Hints for the building of bungalows. J. G. Densey. plans Bldg Age 37:52-4 S '15
Low-cost hollow tile bungalows. il diags plans Bldg Age 37:31-6 D '15
Plumbing and heating in California bungalow. A. C. Shaver. il plan Metal Work 83:465-7+ Mr 26 '15
Popular bungalow-court idea: layout and de-

Mr 26 '15
Popular bungalow-court idea; layout and description of St. Francis court at Pasadena C: A. Byers. il diags plans Eldg Age 37 19-22 Ap '15
Southern home of bungalow type. il diags plans Bldg Age 37:19-23 Jl '15
Summer cottage in the Maine woods. C: A. Byers. il plans Bldg Age 37:19-22 Je '15

Bunsen burners

Distribution of gases in the bunsen flame. Sci Am 112:470 My 22 '15

Buoys Lighthouse illumination. R. Haskell. Illum Eng Soc 10:215-17 no 3 '15

Buret reader

Simple buret reader. L. S. Pratt. diags Am Chem Soc J 37:1730-1 Jl '15

Burets Simple automatic-zero burette. A. T. Mertes. diag J Ind & Eng Chem 7:786-7 S '15

Burke relief foundation, White Plains, N. Y.
Burke foundation for convalescents, White
Plains, N. Y. il Arch & Bldg 47:317-23 S '15
Winifred Masterson Burke relief foundation,
White Plains, N. Y.; views and plans.
Brickb 24:pl 91-6 Jl '15

Burma

See also Railroads-Burma

## Industries and resources

Bawdwin mines of the Burma corporation. Il map plan Eng & Min J 99:177-80 Ja 23 '15 Wolframite in lower Burma. E. M. Lefroy. Eng & Min J 99:684 Ap 17 '15

Burners

Adjustable burner for liquid fuel. diag Am Soc M E J 37:118-19 F'15 Crude oil as fuel in heating systems, H. S. Haley, diags Dom Eng 70:104-6, 139-41 Ja 23-30'15

See also Bunsen burners; Gas burners; Oil burners

Burnham, Daniel Hudson, d. 1912
Burnham as a pioneer in city planning, W: E.
Parsons, il plans Arch Rec 38:13-31 Jl '15
Daniel Hudson Burnham and his associates.
P: B. Wight. il por Arch Rec 38:1-12 Jl '15
Work of Burnham & Root, D. H. Burnham,
D. H. Burnham & co. and Graham, Burnham & co. A. N. Rebori. il plans Arch Rec
38:32-168 Jl '15

Burroughs adding machine co. Workmen's co-operation reduces accidents. il Iron Age 95:1051-4 My 13 '15

Busbar supports Hangers and wall bushings for storage-battery bushars, diags Elec W 66:1205 N Busbar supports Continued

proved disconnecting switches and busbar supports for large generating plants, il Elec R & W Elec'n 67:728-31 () 16 '15; Elec W 66:883-4 O 16 '15

l three-way busbar supports, il diag R & W Elec'n 66:358 F 20 '15 Special

Buses, Electric. See Electric buses

Buses, Jitney. See Jitney buses

Buses, Motor. See Motor buses

Bushings

ushings Machining bushings on the drill press. W. H. Sawtell, il diags Mach 21:1012 Ag '15 Machining thin bronze bushings. A. A. Dowd. diags Mach 21:980-2 Ag '15 Mushroom gates and risers. Foundry 43:69 F

Bushmen Bushmen of the Moori river, Natal. D. Waterson. il Sci Am 112:191 F 27 '15

Business

Address before the A. E. R. A. W. Wilson. Elec Ry J 45:275-8 F 6 '15; Same cond. Elec W 65:368-9 F 6 '15; Abstract. Elec Ry J 45: 217-18 Ja 30 '15

217-18 Ja 30 '15
Better business building blocks. G. R. Adams.
Dom Eng 73:105-7, 142-4 O 23-30 '15; Same
cond. Metal Work 84:533-5 O 22 '15
Business man and Congress. L. W. Moffett.
Iron Tr R 55:1229-30 D 31 '14
Business questions considered, by the Chamber
of commerce of the United States. Iron Age
95:334-5 F 11 '15
Destructive and constructive regulation of
business. R. R. Lounsbury. Am Ind 16:10-13
Ag '15

Ag '15
Modern commercial distribution. Am Gas
Light J 103:135, 138-9 Ag 30 '15
Money and time saving recording systems;
reading of trade journals and books. R. T.
Gebler. Metal Work 84:300-2 S 3 '15
Organized business methods needed. J: H.
Fahey. Metal Work 84:33 Jl 9 '15
Small corporation—a pitfall. J. R. Smith. Eng
M 49:672-8 Ag '15
Value of friendship in business. E: A. Roberts.
Bidg Age 37:35 Ag '15

See also Accounting: Advertising: Audit-

See also Accounting; Advertising; see also Accounting; Advertising; Auditing; Business conditions; Business depression; Card system in business; Commerce; Competition; Corporations; Credit; Department stores; Export trade; Mail order business; Manufactures; Merchants; Office management; Panics; Purchasing; Salesmen and salesmanship; Scientific management; Show windows

Business cards

Business-cards—a few suggestions. J. L. Frazier. Inland Ptr 56:65-8 O '15

Business conditions

Address delivered before the Youngstown chamber of commerce. T. W. Robinson. Iron Tr R 56:934-6a My 6 '15; Same cond. (Road to better business conditions) Iron Age 95: 1000-1 My 6 '15
Better business conditions and permanent prosperity. Ry R 57:598-9 N 6 '15
Business conditions; abstracts. E. H. Gary. Iron Age 95:1240-2 Je 3 '15; Iron Tr R 56: 1119-21 Je 3 '15
Business from manufacturers' standpoint in middle West. Metal Work 83:71-3 Ja 1 '15
Foreign and domestic commerce and business generally. J. A. Farrell. Eng Soc W Pa 31: 223-8 Mr '15
Has the tide turned? R. W. Babson, Print Processing Processing Print Processing Print Prin

223-8 Mr <sup>15</sup>
Has the tide turned? R. W. Babson. Brickb <sup>23:311-12</sup> D <sup>'14</sup>
How is business? comment by manufacturers. Elec R & W Elec'n 67:413-16 S 4 <sup>'15</sup>
Outlook in other industries; comment by editors of various trade publications. Elec R & W Elec'n 67:417-27 S 4 <sup>'15</sup>

Railways and prosperity. A. L. Mohler. Ry R 56:181-2 F 6 '15

Sane optimism. C. M. Lemperly. Metal Work

apply manufacturers and dealers meet. Iron Age 95:1290-3 Je 10 '15 Supply

See also Business depression

82:781 D 11 '14

Business correspondence. See Commercial correspondence

Business depression

Letters of Messrs. Tripp and Matthews on business conditions. W. F. Hickernell. Elec W 65:972-3 Ap 17 '15

Present industrial depression. G. E. Tripp. Elec W 65:11-12 Ja 2 '15; Discussion. C. L. Mat-thews; G. E. Tripp. 65:517-18 F 27 '15

Sce also Panics

Business education

Business college graduate in the business field. J. P. Joplin. J Account 19:182-90 Mr '15

Business ethics

Sec also Competition

Business law. See Commercial law

Business men

usiness men Administration and business men. L. Cromwell. Textile World 49:240-2 My '15

Business men and public service. Ry R 55:688-90, 716-18, 775-7; 56:33-5, 127-9, 193-4, 207-8

D 5-12, 26 '14, Ja 16-23, F 6-13 '15

Government's business. It needs regulation by business men. Ry R 55:746-8 D 19 '14

Butane

apor pressures of propane, propylene and normal butane at low temperatures. G. A. Eurrell and I. W. Robertson. Am Chem Soc J 37:2188-93 S '15 Vapor

Butchart riffle system
Development of the Butchart riffle system at
Morenci, D: Cole, il diags Am Inst Min E
Bul 98:431-44 F '15; Excerpt. Met & Chem
Eng 13:332 My '15; Discussion. Am Inst Min
E Bul 101:1123-8 My '15

Butler brothers, Chicago Electrical construction details of Butler brothers building. N. G. Meade, il diags Elec R & W Elec'n 66:1183-90 Je 26 '15

Butte, Montana

Occurrence of covellite at Butte. A. P. Thompson. il Am Inst Min E Bul 100:645-77 Ap '15; Discussion. 108:2464-71 D '15

Butte, Anaconda & Pacific railway

cutte, Anaconda & Pacific railway
Contact system of the Butte, Anaconda & Pacific railway. J. B. Cox. il diags map Am
Inst E E Pro 34:1447-76 Ag '15; Same. Gen
Elec R 18:842-59 Ag '15; Abstract. Elec Ry J
46:59-60 Jl 10 '15
Electrical operation of the Butte, Anaconda
& Pacific railway. J. B. Cox. il maps Am
Inst E E Pro 33:1729-53 N '14; Same. Gen
Elec R 17:1047-65 N '14; Abstract. Elec Ry
J 44:1050-1 N 7 '14; Discussion. Am Inst
E E Pro 34:134-43 Ja '15
One year's electrical operation of the B. A. &
P. J. B. Cox. Ry Age 57:1193-5 D 25 '14
Results of B., A. & P. railway electrification.
Eng & Min J 99:529-30 Mr 29 '15

Butte & Superior copper co. Report for 1914. Eng & Min J 99:1081 Je 19 '15

Butter, Substitutes for Modern substitutes for butter. Sci Am S 80:27 Jl 10 '15

Butter fat

utter fat
Apparent effect of acetic acid upon the constants of butter fat. C. Bahlman, J Ind & Eng Chem 7:680-1 Ag '15
Determination of fat in ice cream by the Babcock method. C. A. A. Utt. J Ind & Eng Chem 7:773 S '15
Device for the successive determination of the solids and fat in milk and other fluids. A. Seidenberg. J Ind & Eng Chem 7:769-73 S '15 A. S.

Butternut

Butternut trees as a weed eradicator. Sci Am 112:130 F 6 '15 Use of native woods for interior finish. C. M. Price, il Brickb 24:241-2 O '15

Buying. See Purchasing

Cabinet. See United States-Cabinet

Cabinet work
Cabinet work for the carpenter, P. D. Otter.
diags Bldg Age 37:49-50 N '15

See also Furniture; Sewing cabinets

Cable-laying plow. il Elec W 65:41 Ja 2 '15 Cable railroads

Two-car trains on 25 per cent grade, diags Elec Ry J 45:977-8 My 22 '15

Mechanical cable connectors. il Elec Ry J 45: 1216-17 Je 26 '15

New grips for cables and wires, il Iron Age 96: 418 Ag 19 '15

418 Ag 19 '15
Service and tests of Mayari incline cables; abstract, J. E. Little, Am Soc M E J 37: 236-7 Ap '15
Service and tests of 3-in, wire cable, Eng N 73:685 Ap 8 '15
Steel cable grip, il diags Elec R & W Elec'n 66:1210 Je 26 '15
Wire cables of various types and materials tested by U. S. Bureau of standards, il diag Eng Rec 72:567-8 N 6 '15

See also Cable railroads; Cableways; Electric cables; Rope; Wire

Cables, Electric. See Electric cables

Cables, Submarine Cable-repairing steamer "Transmitter." F. Coleman, il plan Int Marine Eng 20:382-6 S

French-built cable ship Edouard Jéramec. F. C. Coleman, il diags Int Marine Eng 20: 146-50 Ap '15

146-50 Ap '15 Mobilizing news. C: E. Crane, il Sci Am 112: 134-5 F 6 '15 Submarine cable installation across Wallabout canal. il Elec Ry J 45:805 Ap 24 '15 Submarine cable rapid telegraphy; ocean and intercontinental telephony. B. Gati. il diags Am Inst E E Pro 34:2101-29 S '15 Unbroken alternating current for cable tele-graphy. G: O. Squier. diags J Fr Inst 180: 311-34 S '15; Abstract. Elec W 66:299-300 Ag

Cableways

erial ropeways. il diags Engineer 119:53-5, 108-10, 222-5, 352-5, 375-6 Ja 15, 29, Mr 5, Ap 9-16 '15

Aerial ropeways. H: Davies. Engineer 119:144 F 5 '15

Cableway carries curved reinforcing bars up steep hill. G; W. Davidson, il Eng Rec 72: 492 O 16 '15

492 O 16 '15
Cableway coaling station, il plans Ry Age
58:336 F 19 '15
Design and construction of aerial ropeways,
diags Engineer 120:79-81 Jl 23 '15; Excerpt
(Power for driving) Eng & Min J 100:393 S
4 '15; Excerpt (Traction rope) Eng & Min J
100:475 S 18 '15; Excerpt (Track ropes) Eng
& Min J 100:518 S 25 '15
Dragline cableway is an effective tool for sand
and gravel plants, il Eng Rec 71:716-18 Je
5 '15

5 '15

Handling construction material by aerial tramways, diags Eng N 72:1170-1 D 10 '14

Hoist on revolving headframe operates dragline, diags plan Eng Rec 71:742-3 Je 12 '15

Home-made cableway changes shafting on caisson job, H. D. Hammond, il Eng Rec 72: 147-8 Jl 31 '15

Temporary traveling cableway at Goldfield mines, il Eng N 74:753-4 O 14 '15; Same, Eng & Min J 100:673 O 23 '15

Unique conveyor in automobile plant, il plan Iron Age 96:565-8 S 9 '15

See also Conveying machinery: Suspended

See also Conveying machinery; Suspended railways; Telpherage

Caboose cars. See Cars, Caboose

Cabriolet. See Automobiles-Bodies

Cadmium

Atomic weight of cadmium, G. A. Hulett and E. L. Quinn, Am Chem Soc J 37:1997-2000 S

Reproducibility of the cadmium electrode, F: H. Getman and V. L. Gibbons, il Am Chem Soc J 37:953-70 My '15
Revision of the atomic weight of cadmium: the electrolytic determination of cadmium in cadmium chloride. G. P. Baxter and M. L: Hartmann. Am Chem Soc J 37:113-31 Ja '15

Cadmium chloride Revision of the atomic weight of cadmium: the electrolytic determination of cadmium in cadmium chloride. G. P. Baxter and M. L.:
Hartmann. Am Chem Soc J 37:113-31 Ja '15 Cadmium iodide

Study of alcoholic solutions of cadmium iodide. F: H. Getman and V. L. Gibbons. Am Chem Soc J 37:1990-6 S '15

Caesium chloride

Ionic hydration and transference numbers of caesium chloride, E; W. Washburn and E. B. Millard. Am Chem Soc J 37:694-9 Ap '15

Caffein

Estimation of caffeine and antipyrin in admixture. W. O. Emery and S. Palkin. J Ind & Eng Chem 7:519-21 Je '15

Cairo, Egypt

Bridges

New swing bridge over the Nile at Cairo, il diags Engineer 120:270-2, 274 S 17 '15

Sewerage

New sewerage system of Cairo, Egypt. diags Eng N 74:545 S 16 '15

Caissons

Balboa docks. il Sci Am 112:48 Ja 9 '15 Building concrete caissons in the Platte river. J. H. Merriam. il diags Ry Age 59:383-6 Ag

ome-made cableway changes shafting on caisson job. H. D. Hammond. il Eng Rec 72:147-8 Jl 31 '15 Home-made

Lock entrance caisson for the Panama canal. L: A. Mason, il diag plan Gen Elec R 18: 210-16 Mr '15; Same cond, Eng N 72:1099-1102 D 3 '14 Railroad building under and over the streets of New York, il map Sci Am 113:96-7+ Jl 31

See also Bridges—Foundations and piers; Compressed air; Foundations

Calamine

Why not call things by their right names? A. H. Purdue. Eng & Min J 100:765-6 N

Sec also Zinc ores

Calcium carbide

of Herman L. Hartenstein. Met & Chem Eng 13:763 O 15 '15

Description of patent. Met & Chem Eng 13:763 O 15 '15

Description of patent. Met & Chem Eng 13: 642-3 S 15 '15

Preparation of pure calcium carbide. M. D. Thompson, Met & Chem Eng 12:779-80 D '14

Calcium carbonate
Solubility-product constant of calcium and
magnesium carbonates, J: Johnston. Am
Chem Soc J 37:2001-20 S 15

Calcium chloride
Comparison of the relative drying powers of sulfuric acid, calcium chloride and aluminum trioxide when used in ordinary Scheibler desiccating jars. J. W. Marden and V. Elliott. J Ind & Eng Chem 7:320-1 Ap '15

Calcium nitrate

conductivity study of the reaction between calcium nitrate and dipotassium phosphate in dilute solution. W. A. Withers and A. L. Feild, Am Chem Soc J 37:1091-1105 My '15 Solubility curves of salt hydrates: calcium nitrate, H. S. Taylor and W: N. Henderson, Am Chem Soc J 37:1688-94 Jl '15

Calcium silicate

Comparison of silicates and carbonates as sources of lime and magnesia for plants. W. H. MacIntire and L. G. Willis. il J Ind & Eng Chem 6:1005-8 D '14

Calcium sulphate. See Anhydrite

Calculating machines

Arithmetical machines. H. E. Goldberg, il diags W Soc E J 19:859-80 N '14; Same, Sci Am S 79:59-60, 75-6 Ja 23-30 '15

Computing machine for areas of irregular tracts, C. D. Norton. Eng N 73:396 F 25 '15 Computing machines in engineering. P. H. Skinner. il Eng N 73:25-7 Ja 7 '15

Electric calculating machine for engineer and contractor. il Munic Eng 48:74-5 Ja '15

Fraction calculator. F. Szabo. diags Mach 21: 670-1 Ap '15

Handy flywheel calculator, il Power 42:683 N

Calculating machines-Continued

Machine accounting in a pump works; Hollerith tabulating system. S. G. Koon, il Iron Age 96:408-11 Ag 19 '15 Multiplying large numbers on adding machines, R. C. Hardman, Eng N 74:703 O 7

P15
Possible Calculator. il Power 40:873-4 D 22 '14
Reducing square feet to decimals of acres.
Eng N 74:363 Ag 19 '15
Ross precision computer giving results accurate to five places. il Eng & Contr 44:298 O
13 '15; Elec W 66:604 S 11 '15; Colliery 36:
166-7 O '15; Eng Rec 72:466 O 9 '15
Wage premium calculator. il Iron Age 96:757
S 30 '15

See also Slide rule

Calendars

Perpetual calendar, W. J. Spillman; S. F. Kennedy, il Sci Am S 79:141 F 27 '15

Calgary, Alberta

Electricity supply

Cost of combination electric service. Elec W 65:1181-3 My 8 '15

Rapid transit

Calgary's municipal street railway. W. E. Hardenburg. il Munic J 39:395-7 S 9 '15

Calibration

alibration charts for Vanderbilt tenders. T. Price, Ry Age (Mech ed) 89:563-5 N '15 Calibration curve for horizontal cylindrical tanks. Met & Chem Eng 13:511 Ag '15 Calibration of current transformers by means of mutual inductance. C: Fortescue, il diags Am Inst E E Pro 34:1199-1215 Je '15

California

Architecture

Country house architecture on the Pacific coast, L: C. Mullgardt, il plans Arch Rec 38:423-51 O '15

Description and travel

California tree novelties. E. A. Sterling. il Am For 21:768-78, 853-60 Jl-Ag '15 Motor travel in desert country of southern California. L: H. Eddy, il Eng & Min J 100: 835-7 N 20 '15 Ski travel in California. W. H. Wright. il Eng & Min J 99:521-2 Mr 20 '15

Flood control

\$16,000,000 required for Los Angeles county flood protection. il diags map Eng Rec 72: 204-6, 232-3 Ag 14-21 '15

Industries and resources

California oil in 1914. M. L. Requa. Eng & Min J 99:139-40 Ja 16 '15

Pacific coast iron situation; the iron ores of California and possibilities of smelting, C: C. Jones. map Am Inst Min E Bul 105:1887-98 S '15; Discussion. 108:2496-501 D '15
Topping plants of California. A. F. L. Bell. il diags Am Inst Min E Bul 105:1769-99 S '15

California (battleship)
Keel of first electrically propelled battleship
laid. Elec W 66:844 O 16'15

United States battleship California and class. Sci Am 113:63 Jl 17 '15

California association of electrical contractors and dealers

By-laws. Elec R & W Elec'n 67:841-3 N 6 '15 California state association of master plumbers 14th annual convention, San Francisco, July 1-2. Dom Eng 72:146-9 Jl 31 '15

Convenient form of plate caliper. Locomotive 30:169-70 Ap '15

See also Micrometers

Callow pneumatic process. See Flotation process

Calorimeters and calorimetry
Acid-resisting alloy to replace platinum in
the construction of a bomb calorimeter.
S. W. Parr. il Am Chem Soc J 37:2515-22

Aneroid calorimeter, H. C. Dickinson and N. S. Osborne. il diags U S Bur Stand Bul 12:22-48 O 28 '15; Abstract. Am Soc M E J 37:294 My '15; Summary. J Fr Inst 179:492-3 Ap '15 Aneroid calorimeter and specific heat of ice. Iron Tr R 57:223 Jl 29 '15
Apparatus for the study of heat radiation. J. D. Hoffman. il Heat & Ven 12:28-30 O '15
Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid, and naphthalene. H. C. Dickinson. bibliog U S Bur Stand Bul 11:189-257 Mr 1 '15 Diagram for throttling calorimeter. R. S. Bayard. Power 42:618 N 2 '15 Difficulty of measuring heat, with special reference to radiated and convected heat. A. H. Barker and F. C. S. Brendal. Heat & Ven 12:21-4 My; 33-4 Je '15
Easy calorimetric methods of high precision W. P. White. diags Am Chem Soc J 36:2313-33 N '14
Effect of high ignition-voltages on the accuracy of bomb calorimeter determinations. E: J. Dittus. diag Met & Chem Eng 13:480-1 Ag '15
Gas testing ordinances; coming of calorimetry. J. Ahady il Am Cas Light L 101:280-71 D. 14

Gas testing ordinances; coming of calorimetry, J. Abady. il Am Gas Light J 101:369-71 D 14 '14

'14
Heats of combustion of aromatic hydrocarbons and hexamethylene. T. W. Richards and F: Barry, il Am Chem Soc J 37:993-1020 My '15
How radiant heat from gas radiators is determined, plan Heat & Ven 12:24-6 My '15
Potentiometers for thermoelectric measurements especially in calorimetry. W. P. White, diags Am Chem Soc J 36:1868-85 S '14

Standardization of bomb calorimeters. U S Bur Stand Circ 11:1-17 '15

Synthermal regulator, a device for automatically maintaining an adiabatic condition in calorimetry. T. W. Richards and G: D. Osgood, diag Am Chem Soc J 37:1718-20 Jl '15

Testing fuel with the Emerson calorimeter, diag Eng M 49:sup2-3 S '15

Tests of a new recording calorimeter. C. H. Stone and W. H. Hinman, Am Gas Inst Pro 9:pt 1, 200-10 '14; Same, Am Gas Light J 101: 387-90 D 21 '14; Discussion. Am Gas Inst Pro 9:pt 1, 210-17 '14

Thermoelement installations, especially for calorimetry. W. P. White, diags Am Chem Soc J 36:1856-68 S '14

Thermoelements of precision, especially for calorimetry. W. P. White. il Am Chem Soc J 36:2292-313 N '14

Three methods of measuring radiant heat from gas fires, W. R. Twigg, il diags Heat & Ven 12:33-6 S '15

Vacuum jacketed calorimeters, with especial reference to the degree of thermal insulation secured by the use of a vacuum jacket. U S Bur Stand Bul 11:319-29 Mr 1 '15

See also Cooling; Specific heat

Calorizing Aluminum alloys as surface protection for metals subject to high temperatures. Eng N 72:1123 D 3 '14

Calorizing: a protective treatment for metal. H. B. C. Allison and L. A. Hawkins. il Gen Elec R 17:947-51 O '14; Same. Sci Am S 78:341-2 N 28 '14; Same cond. Am Gas Light J 101:309-10 N 16 '14; Same cond. Eng M 48:265-7 N '14; Same cond. Met & Chem Eng 12:730 N '14; Same cond. Iron Age 94:1386-7 D 17 '14; Same cond. Metal Work 82:843-4 D D 17

Calorizing metals Eng 13:325 My metals. W. E. Ruder. Met & Chem 25 My '15

Calvert, Texas

Water supply

Sewage-treatment plant at Calvert. T: L. Fountain. il diags plan Eng N 73:930-4 My 13 '15

Calycanthus

olatile oil of calycanthus floridus. E. R. Miller, G. W. Taylor, and M. H. Eskew. Am Chem Soc J 36:2182-7 O '14

Cambria steel company Report for year ended December 31, 1914. Iron Age 95:356-7 F 11 '15

Cambridge university press

Electricity in the publiching business, il Elec

R & W Elec'n 65:1069-72 D 5 '14

Camden, New Jersey

#### Streets

Camden's municipal asphalt plant. il Munic J 38:127-9 F 4 '15

Cameragraph

Machine reproduces, develops and prints all in itself, il Eng Rec 72:32 Jl 3 '15 Photographing on both sides of a sheet, il Iron Age 95:1122-3 My 20 '15

Cameras

ameras
Camera for reading meters, il Am Gas Light
J 103:141 Ag 30 '15; Mach 22:75-6 S '15
Convenient color camera. C. M. Clark, diags
J Ind & Eng Chem 6:1012 D '14
Photographic maps; methods of producing correct charts with the camera. Kappel. il diags
Sci. Am S 01:200-1 S 25 '15

Positive postcard camera. diag Sci Am S 78: 384 D 12 '14

Sec also Photography

Camp buildings. See Construction camps

Campbell, William Wallace, 1862-Pressent American as ociation for the ad-vancement of science. M. Benjamin. por Sci Am 113:98 Jl 31 '15

Our beginnings in camphor, Sci Am 112:71 Ja

Camping

Boy scouts and forests. K. W. Woodward, il

Camps, Construction. See Construction camps

Camps, Military
Camp engineering—water purification. Sci Am
S 79:383 Je 12 '15

see also Concentration camps

Cams

ams Cutting barrel cams on the lathe, M. H. Chase, diags Mach 22:230-1 N '15
Improved form of cam for stamp mills. A. B. F'oote, diag Am Inst Min E Bul 96:2765-6
D '14; Same, Eng & Min J 98:1046 D 12 '14

Camshafts

Thermit welding of camshafts. A. H. Jones. Met & Chem Eng 13:929 D 1 '15

Canada

and al.on in perspective; Canada at the Pan-ama-Pacific exposition. E; H. Hurlbut. il Sci Am S 80:17, 24-5 Jl 10 '15

See also Railroads Canada

## Description and travel

Packs in the Canadian Cordillera, J. A. Allan, il Sci Am S 80:360-2 D 4 '15

Industries and resources

Mineral production of Canada. J Eng & Min J 99:488-9 Mr 13 '15 J: McLeish.

See also Mine, and mineral resources — Canada; Water power Canada

Canadian and international good roads convention

l convention and exhibition, Toronto, Ont., March 22-26. Good Roads n s 9:148-9 Ap 3

Canadian mining institute
Canadian mining institute

17th annual convention, Toronto, March 3-5.

Canadian Northern railroad

Canadian Northern railroad
Considers forthern railroad
56:148-9 Ja 30 '15
Canadian Northern Ry, opened to the Pacific
con 1 R map ling N 74:1098-9 D 2 '45
Canadian Northern tunnel and terminal electrification, W. C. Lancaster, il diags maps
Gen Elec R 17:1066-18 N '11; Same, Ry R 55:
710-15 D 12 '11
Completing the Many Lancaster

Completing the Mount Royal tunnel into Mon-treal, il diags plan 18, Age 59,857 69 N 5 '15

Canadian Pacific railroad
Annual report for the year ended June 30,
1915, map Ry Age 59:277-8, 410 12 Ag 27 '15
Calculations showing economy of constructing
the Rogers Pass tunnel, J. G. Sullivan,
diags Eng & Contr 44:398-400 N 17 '15

Comparison of the old and new lines of the Canadian Pacific at Rogers Pass, B. C. J. G. Sullivan. Ry Age 58:194-5 Ja 29 '15 Driving a five-mile tunnel through the Sel-kirks. il diags map Ry Age 57:1082-4 D 11 '14

Piercing the Selkirk mountains for a five-mile tunnel, il map Eng Rec 70:604-6 D 5 '14; Same cond, Eng M 48:760-2 F '15

Canadian society of civil engineers 29th annual meeting, Montreal, Jan. 26 to 28, 1915. Eng N 73:235 F 4 '15

circumventing Niagara falls. B. Farrows. Il map Sci Am S 78:387-8 D 19 '14 Connecting Idaho with the sea; completion of the Celilo canal along the Columbia river. F. W. Vincent. il Sci Am 112:476 My 22 '15 Construction of the Welland ship canal. W. A. Christe il vices but Marine English 12 Acceptable 11 vices but Marine English 20 24.

Craick, il plan Int Marine Eng 20:154-6 Driving the tunnel for the Marseilles-Rhone canal, R: F. Wagner, diag Eng N 71:803-4 O 21 '15

O 21 '15
Largest tunnel in the world. E. L. Corthell.
diags map Eng N 74:386-7 Ag 26 '15; Abstract. Eng & Min J 100:800 N 13 '15
Old wall used as coffer-dam fails at Louisville. il Eng N 74:764-5 O 14 '15
Preliminary estimating of canal excavation.
L: M. Hammond. Eng Rec 71:146-7 Ja 30 '15
Proposed Lake Erie and Ohio river canal;
with discussion. G. F. Stickney. map Eng
Soc W Pa 31:285-33 My '15

Rove tunnel on the canal from Marseilles to the Rhone. Bourgougnon, diags Eng & Contr 43:536-7 Je 16 '15

Seventy years of civil engineering, il Sci Am 112:529 Je 5 '15

Ship canal for New Orleans, La. map Eng & Contr 44:sup23-4 Ag 18 '15

See also Aqueducts; Irrigation canals; Waterways; also names of canals, e.g. New

Waterways; also names of canals, e.g. New York state barge canal, Panama canal

# Locks

See Locks (canals and rivers)

Cancer

Danger of delay in cancer. Sci Am 112:424 My

Radium treatment of cancer. Sci Am S 79:409

What everyone should know about cancer. J. C. Bloodgood. Sci Am S 79:231 Ap 10 '15 Canneries

Disposal of cannery wastes. D. Englis. Munic J 38:68-9 Ja 21 '15

Canning and preserving
Canned-goods trade in the Far East, J. A.
Shriver, U S Bur For & Dom Com 92:1-78

Canned-tomato industry in Italy. J. A. Shriver. U S Bur For & Dom Com 93:1-23 '15

Contributions of the chemist to the preserved I. Bentley. J Ind & Eng foods industry, R. I. Chem 7:287-9 Ap '15

Effect of the mineral content of water on canned foods. H. L. Huenink and E: Bar-tow. J Ind & Eng Chem 7:195-6 Je '15

Methods followed in the commercial canning of foods, A. W. Bitting, 3 pls U S Agric Bul 196:1-79 '15

Pineapple-canning industry of the world. J. A. Shriver. U S Bur For & Dom Com 91:1-43

Utilizing wastes in canning pineapples. Sci Am S 79:361 Je 5 '15

See also Canneries; Food preservation

Cannon ball tree Cannon ball tree of tropical America, il Sci Am S 79:92 F 6 '15

Cantilever bridges. See Bridges, Cantilever

Canvastown for government employees in New South Wales. il Sci Am 112:479 My 22 '15 Caoutchouc. See Rubber

Cape Girardeau, Missouri River-front improvement at Cape Girardeau, il Eng N 73:874-5 My 6 '15

Capillarity

apillarity
Capillary concentration of gas and oil. C. W. Washburne, Am Inst Min E Bul 93:2365-78 S '11; Discussion, 100:831-46 Ap '15
Drop weight method for the determination of the surface tension of a liquid, J. L. R. Morgan, Am Chem Soc J 37:1461-7 Je '15
Surface tension due to intermolecular attraction, O. Lelmann, diags Sci Am S 80:341 N 27-14.

Surface tensions of water, methyl, ethyl and isobutyl alcohols, ethyl butyrate, benzene and toluene. T. W. Richards and L. B. Coombs. il diag Am Chem Soc J 37:1656-76

See also Brownian movements

Capital

Capital and income—capital and revenue, A. J. B. Schmidt, J Account 20.283-40 (O.15) Capital as a liability, J Account 18:447-9 D. 14 Working capital, W; J. Norton, Am Inst E E Pro 34:2149-58 S. 15

See also Banks and banking; Interest; In-

Capitol buildings

apitol buildings
Heating and ventilating plant for the Missouri state capitol; reversible system of air supply for house and senate chambers, il diags plans Heat & Ven 12:18-21 My 15
Thomas Jefferson and the first monument of the classical revival in America, F. Kimball, il Am Inst Arch J 3:370-81, 421-34, 473-91
S-N '15
Ligh yitte copital il America

state capitol. il Arch & Bldg 47:324-30

Car. See Cars

Car and locomotive painters' association. See Master car and locomotive painters' associ-

Car builders' association, Master. See Master car builders' association

Car cleaning

Car-cleaning practice. Elec Ry J 45:515-16

Mr 13 '15 Plant for sand blasting steel cars, diags Ry Age 59:397-8 Ag 27 '15; Same, Ry Age (Mech ed) 89:427-8 Ag '15 Use of the vacuum system for cleaning cars in San Francisco, F. W. Allen, il Elec Ry J 46:516-17 S 18 '15 CF. F. L. Useiges '11 Elec

Vacuum cleaning cars. E. J. Haines. il Elec

Car couplings
Automatic freight truck coupler, il Ry Age
59:467-8 S 10 '15

Emergency coupler head, diag Ry Age (Meched) 89:484-5 S '15 Handling coupler yokes, il Ry Age (Meched)

Master car builders' association committee report. Ry R 56:837-8 Je 19 '15
Omaha coupler with air and electrical connections for trailer service. T. E. Wood. II diags Elec Ry J 44:1257 D 5 '14
Proposed M. C. B. standard coupler. Ry R 55: 765-6; 56:59-60, 121, 186-7 D 26 '14, Ja 9, 23, F 6 '15

Car distributer. See Railroads-Management

Car dumping machines. See Dumping appliances Car fenders

Novelty in fenders, il diags Elec Ry J 45:723-4 Ap 10 '15

Car ferries

Car ferry of the Florida East Coast railway.
il plan Ry Age 58:188 Ja 29 '15
Car-transfer ferry on the Ohio: C., B. & O.
R. R. diags plans Eng N 74:599-600 S 23 '15

Ice-breaking train ferry steamer, il diag plan (supp) Engineer 120:49-50 Jl 16 '15; Ab-stract, lut Marine Eng 20:515 N 15

Large motor-driven railway train ferry for service in San Francisco bay, C: J. Belden, il plans lut Marine Eng 20:302-4 Jl 15 for

ew car ferry with adjustable deck from Moneton, N. B. across the St. Lawrence river, il diag Ry Age 58:365-6 F 26 15

Portable stop for a car-ferry incline, diag Eng N 74:221 Jl 29 '15

Roads allowed to retain ear ferries. Ry R 56: 721-3 My 29 '15

Side-wheel car ferry Contra Costa. E: W. Olin. il diags Int Marine Eng 20:385-94 S '15 To Cuba by rail. H. C. Plummer. il map Sci Am S 79:40-1 Ja 16 '15 Train ferries, Swedish state railways. il diag plan Ry R 57:299-301 S 4 '15

Car heating

ar neating and electric heater control, W: S. Hammond, jr. il diags Am Soc Heat & V E 20:279-93 '14 Light-weight all-steel panel heater, il diag Elec Ry J 46:773 O 9 '15 Study of car-neating requirements. Elec Ry J 45:103-4 Ja 9 '15

Car houses

ar houses
Car maintenance on the San Francisco-Oakland terminal railways. G: St. Pierre, il diags Elec Ry J 16557, 20 S 18 T.
Carhouse for a residential district, il diag plan Elec Ry J 45:660-3 Ap 3 '15
Carhouse of Seattle municipal railway. H. J. Kennedy, il Elec Ry J 45:513-14 Mr 13 '15
Design, construction and detailed costs of a car storage house in Council Bluffs, Iowa. W. L. Fulton, plans Eng & Contr 44:34-5 Jl 14 '15
Enlarging the George street municipal railway.

Enlarging the Geary street municipal carhouses at San Francisco, diags Elec Ry J 45:667-8 Ap 3 '15 Fireproof carhouse at Vancouver, B. C. il

New carbouse and shops at Holyoke, il plan Elec Ry J 45:930-1 My 15 '15

Car inspection

ar inspection
Car service inspection in Seattle, J. W. McCloy, Elec Ry J 46:272-3 Ag 14'15
Chief interchange car inspectors' and car
foremen's association, 17th annual convention, Ry Age (Mech ed) 89:522-5 O'15
hisportion and repairs of treight cars by
precework, J. J. Tollin, Ry Age (Mec. car)
89:457-8 S'15
Making of

Making of good cur inspectors. A. M. Orr; "E. C." Ry Age (Mech ed) 89:575-8 N '15 Uniformity in car inspection. M. Marea. Ry Age (Mech ed) 89:468 S '15

Age (Mech ed) 89:468 S '15

Car lighting
Analysis of requirements for modern street
car lighting. L. C. Doane, il diags Illum
Eng Soc 10:82-100 no 1 '15
Better car illumination effects other economies.
Elec Ry J 44:1308-9 D 12 '14
Car electric lighting systems. E. S. McNab.
Ry Age (Mech ed) 89:467-8 S '15
Car lighting generator with underframe suspension il diags Ry Age 59:108 Jl 30 '15.
Eng N 73:1084 Je 3 '15
Electric lighting of railway passenger cars.
1, S. M. Machael, Ry R 37, 30:109 N 27:15
Illumination of cars. Elec W 65:729-30 Mr 20
'15

'15
Improved head-end axle generating system for train lighting, il Elec R & W Elec'n 67: 490-1 S 11 15
Improved lighting for Westchester cars, il Elec Ry J 46:918-19 O 30 '15
New York mintennal car the lighting, W. G. Gove, il Elec Ry J 45:614-18 Mr 27 '15
Practical study of car lighting problems; with discussion, W. G. Gove and L. C. Porter, bibliog il plans Illum Eng Soc 10:227-52 no 3 '15

Recent improvements in the electric lighting of steam railroad cars. R. C. Lamphier, il dians Am Inst E. F. Pro THINGS 16 Ag. 15 Regulator for car-lighting circuits. fi diags Elec Ry J 45:851-2 My 1 '15

Underframe axle lighting equipment, il diags Ry R 56:568-70 Ap 24 '15; Ry Age (Mech ed) 89:257-8 My '15

Car load. See Freight car service-Car load

Car painting

Master car and locomotive painters' 46th convention. Ry Age 59:565-8 S 24 '15

Master painters' 46th annual meeting. Ry Age (Mech ed) 89:539-42 O '15

Painting cars in two days P. V. Soc. il diag Elec Ry J 45/584-6 Mr 20 '15 Painting locomotives and steel cars. M. L., Sims. Ry Age (Mech ed) 88:64: 2 D '14; Abstract. Am Soc M E J 37:120-1 E '15

Car painting -Continued

Painting steel car doors, diags Ry Age (Meched) 88:643-4 D '14

Relation of the paint shop to the repair yard. W: Buchanan. Ry Age (Mech ed) 89:28-9 Ja

teel car design from a protection stand-point. J: D. Wright. Ry Age (Mech ed) 89: 525-6 O'15

Car pooling. See Freight car service

Car pullers

Car-pullers for switching at industrial plants. Eng N 74:299 Ag 12 '15

Car resistance. See Train resistance

ar roofs
Passenger car roof construction. diags Ry Age
59:332 Ag 20 '15; Same. Ry Age (Mech ed)
89:485-6 S '15
Testing car roofs for leakage. diag Ry Age
(Mech ed) 88:374; 89:399 Jl '14, Ag '15; Ry R
56:787-8 Je 12 '15; Sci Am 113:276 S 25 '15

Car sanitation. See Car cleaning; Car ventilation; Cars—Disinfection

Car shops. See Railroads-Shops

Car signs

Route signs for surface cars. il Elec Ry J 46: 260-2 Ag 14 '15

Car spotting charges. See Railroads, Industrial

ar trucks

Experiments to determine the forces imposed on a truck side frame and the stresses produced. L. E. Endsley. il diags Ry R 56:460-8, 494-7 Ap 3-10 '15; Same cond. Ry Age (Mech ed) 89:127-9 Mr '15

Forsythe forged truck side frame. il Ry R 57: 187 Ac 7:15

187 Ag 7 '15 our wheel trucks for passenger cars. R. V. Wright. diags Ry Age (Mech ed) 89:569-74

Master car builders' association committee report. Ry R 56:841-2 Je 19 '15 Narrow-gage cars for the Burma mines Ry. F. C. Coleman, il plans Ry R 57:173-5 Ag 7

Rolled steel truck frames, il Ry Age 59:331 Ag 20 '15

Truck designed for low maintenance costs, il Elec Ry J 45:1126 Je 12 '15

See also Draft gears

Car ventilation

ar ventuation
Improvement in sanitation of cars; with discussion. D. I. Cooke. il diags Am Soc Heat & V E 20:253-78 '14
Tests of exhaust ventilators on passenger trains. G: L. Fowler. Ry Age 58:1009-12 My 14 '15; Same. Ry Age (Mech ed) 89:235-8

Ventilation of sleeping cars. T: R. Crowder. Ry Age (Mech ed) 89:464-6 S '15

Car wheels

Accident caused by defective wheels. H. W. Belnap, Ry Age 59:48 Jl 9 '15
Annealing car wheels. W. J. Keep. Foundry 43:187-8 My '15
Association of manufactures of chilled iron wheels providential coderors of chilled iron

ssociation of manufacturers of chilled iron wheels; presidential address. G: W. Lyndon. Ry R 57:565-6 O 16 '15; Same cond. Ry Age 59:690 O 15 '15; Same cond. Ry Age (Mech ed) 89:578 N '15; Excerpts. Elec Ry J 46:918 O 30 '15

Boring machine for car wheels, il Iron Tr R
55:1180 D 24 '14

Built-up car wheels declared inadequate, diag
Eng N 74:11 Jl 1 '15

Carwheel grinding machine, il Iron Age 94:
1485 D 31 '14

Cause of thick and thin wheel flanges. J. P. Barnes. Elec Ry J 46:189-90 Jl 31 '15

Chicago elevated shop practice. il Elec Ry J 45:551-2 Mr 20 '15

Chill and shrinkage of cast iron. R. A. Pitman. Foundry 43:304 Ag '15

Chilled car wheels. W. J. Keep. Foundry 43: 469 N '15

Control of chill in cast iron, considering the elements effective in the manufacture of malleable castings and chilled car wheels. G. M. Thrasher. il Am Inst Min E Bul 106: 2129-38 O '15; Same. Foundry 43:491-3+ D '15; Same. Iron Tr R 57:1171-3+ D 16 '15

Danger of welding processes as applied to tires and wheels. M. D. Hayes. il Elec Ry J 45: 342-4 My 15 '15 Effect of car-wheel diameter on motor heat-ing. Elec Ry J 46:70 Jl 10 '15 Effect of car-wheel diameter on motor heat-ing. A. L. Broomall. Elec Ry J 46:452-3 S 11

Effects of variance in car-wheel diameters on motors, A. S. Langsdorf, Elec Ry J 44:1344 D 19 '14

D 19 '14

Energy contained in revolving wheels and locomotive side rods. W. E. Symons. Ry Age 59:455 S 10 '15

Fuel ratio for car wheel iron. A. S. Dowler. Foundry 43:97-8 Mr '15

Fuel ratio on car wheel iron. W. J. Keep. Foundry 43:51-2 F '15

Grinding street car wheels under the car. il Mach 21:462 F '15

Making car wheels at the Lenoir car works. G. S. Evans. Foundry 43:351-3, 428-31, 435-9 S-N '15

Old and new methods.

Old and new methods of making carwheels. C: V. Slocum. diags Iron Age 96:676-9 S 23

Relation of wheel coning to rails and tie plates. W. M. Osborn. Ry R 56:357-9 Mr 13

Report on wreck due to broken car wheel, diags Ry R 56:789-91 Je 12 '15
Restoring steel wheel flanges with a welder, F. A. Murphy, il Elec Ry J 45:719-20 Ap 10 '15

Shrinkage cracks in car wheels. W. J. Keep. Foundry 43:280 Jl '15

Foundry 43:280 Jl '16 Strong claims for chilled iron car wheels. F. K. Vial. Ry Age 58:820 Ap 16 '15 Wheel diameter and motor heating. F. J. Foote. Elec Ry J 46:914 O 30 '15 Wreck due to a faulty car wheel il Iron Tr R 57:937-40+ N 11 '15

See also Axles

Carbide lamps liners' carbide lamps. J. W. Paul. U S Bur Mines Circ 18:1-10 '15

Carbohydrates

Acetolysis of carbohydrates. S. Born and J. M. Nelson. Am Chem Soc J 37:1763-9 Jl '15

Carbolic acid

Analysis of coal with phenol as a solvent. S. W. Parr and H. F. Hadley, il diags map Ill U Eng Exp Sta Bul 76:1-41 '14 Extraction of carbolic acid from oils of the distillation of coal tar. W: Mason. diag Met & Chem Eng 13:293-4 My '15 Phenol for coal analysis. Sci Am S 79:339 My 29 '15 Synthatic rb.

Synthetic phenol and picric acid. A. H. Ney. Met & Chem Eng 13:686-90 O 1 '15; Same. Sci Am S 80:346-7 N 27 '15

Carbolineum Carbolineum and creosote. H. H. Alcock. Am Gas Light J 103:58-9, 125 Jl 26, Ag 23 '15 Carbolineum and creosote. S. R. Church. Am Gas Light J 103:108 Ag 16 '15

Carbon

arbon
Carbon as a heating element in appliances.
C. W. Piper. Elec W 66:134-5 J 17 17 15
Effect of carbon on the physical properties of heat-treated carbon steel. J. H. Nead. il Am Inst Min E Bul 108:2341-57 D '15
Free energy of some carbon compounds. G. N.
Lewis and M. Randall. Am Chem Soc J 37:
458-70 Mr '15
Liguefaction of carbon and the temperature

Liquefaction of carbon and the temperature and conditions of the electric arc. Sci Am S 80:319 N 13 '15

Molecular weight of sodium carbonate and the atomic weight of carbon referred to silver and bromine. T. W. Richards and C: R. Hoover. Am Chem Soc J 37:95-107 Ja '15

Thermoelectric properties of carbon. W: C. Moore. Am Chem Soc J 37:2032-7 S '15

See also Chemistry, Organic; Coal; Coke; Electric light carbons

Carbon bisulphide
Removal of carbon bisulphide from coal-gas.
E. V. Evans. diag Met & Chem Eng 13:23940 Ap '15

Carbon brushes. See Brushes (electric machin-

Carbon dioxide

arbon dioxide
Calculating dry flue-gas loss. C. W. Hubbard.
Power 42:746-8 N 30 '15
Determination of carbon dioxide in baking
powder and carbonates. H. W. Brubaker.
diag J Ind & Eng Chem 7:432-3 My '15
How much CO<sub>2</sub> to expect with various kinds
of fuel. V: J. Azbe. Power 42:712-14 N 23 '15

Carbon dioxide recorders Hays CO<sub>2</sub> and draft recorder, il Eng M 49:sup 5-6 S '15

Parker  $CO_2$  machine, il diags Power 42:297-9 Ag 31 '15

Ag 51 19 Recording power plant operations, J. C. Small-wood, il diags Eng M 50:33-46 O '15 U-tube carbon dioxide indicator, E. A. Cun-ningham, il diag Iron Age 96:870-2 O 14 '15 Carbonia finish. il Am Gas Light J 103:81 Ag 9

Carbonization of coal

Carbonization in bulk—Koppers' ovens. C. J. Ramsburg. il diag Am Gas Inst Pro 9:pt 1, 543-601; Discussion. 601-14 '14

b43-601: Discussion. 601-14 '14 Mode of decomposition of coal by heat. H. C. Porter and G. B. Taylor. diags Am Gas Inst Pro 9:pt 1, 234-83; Discussion. 9:pt 1, 283-8 '14 Report of the committee on progress in carbonization methods. il diags Am Gas Inst Pro 9:pt 1, 450-539; Discussion. 9:pt 1, 539-43 '14

Carbons. Electric light. See Electric light carbons

Carborundum

Carborundum and cork exhibits at the Panama-Pacific international exposition. il Met & Chem Eng 13:458-9 Jl '15 Silica, coke, sawdust and salt. C. F. Williams. Iron Tr R 56:457-8 Mr 4 '15

See also Silundum

Carbureters

Angular venturi in Edwards. diag Automobile 33:940 N 18 '15 Automatic carburetor for explosion motors. A. Krebs. diag Horseless Age 35:474-5 Ap 7

Palanced valve on new Stromberg, il diag Automobile 31:1175 D 24 '14

Brad-Kent carburetor, il Horseless Age 35: 539 Ap 21 '15

Car and carbureter design suitable for driving with any fuel, diags Automobile 33:288-91+ Ag 12 '15

Carbureter and ciling of Stevens-Durves, diag

91+ Ag 12 '15
Carbureter and oiling of Stevens-Duryea. diag
Automobile 32:276 F 11 '15
Carburetion trouble. D. N. McClinton. diag
Power 41:275 F 23 '15
Carburetors and their work. R. C. Collins. il
Horseless Age 36:19 J1 7 '15
Claudel carburetor. diag Horseless Age 35:851
Je 23 '15
Controlling the mixture without

Controlling the mixture without moving parts. diag Horseless Age 35:711-12 My 26 '15

Controlling the mixture without moving parts, diag Horseless Age 35:711-12 My 26 '15 Decision rendered in carbureter suit. Automobile 32:296 F 11 '15 Duplex carbureter for eights, il diag Automobile 32:199 Ja 28 '15 Extended venturi in new Schebler, diag Automobile 32:541 Mr 25 '15 Features of Browne carburetor. Horseless Age 34:923 D 23 '14 Franklin cylinder oil carburetor, il Power 41.

Franklin cylinder oil carburetor, il Power 41: 674 My 18 '15 Gas and air in carbureters. Automobile 32: 371 F 25 '15

371 F 25 '15
Great variety in carbureters, il diags Automobile 32:238-49 F 4 '15
Influence of the carburetor nozzle on the mixture proportion in liquid fuel motors, K. Rummel, diags Horseless Age 35:508-11, 552-5, 584-7, 618-20, 680-2 Ap 14-My 5, 19 '15
Limit gage for distance between an inside and an outside surface, diags Mach 21:493 F '15
Longuemare carbureter now made in America, diag Automobile 33:385 Ag 26 '15
Master carbureter. diag Horseless Age 35:571
Ap 28 '15
New-Speed carbureter, diag Automobile 33:754
O 21 '15
New Stromberg type H carburetor, diag Horse-

New Stromberg type H carburetor, diag Horseless Age 34:879 D 16 '14

T;15 Notes on carburetion. E. T less Age 35:347-50 Mr 10 Putnam. HorseVacuum carburetor system. diag Horseless Age 35:207 F 10 '15 Vacuum-velocity ratio not constant. A. B. Browne. il Automobile 31:1066-7 D 10 '14

See also Automobile engines; Automobiles—Feeding systems; Gas and oil engines

Carburization. See Case hardening

Card clothing

Improved construction invented in Switzer-land. diags Textile World 50:189-90 N '15

Card system in business

Card index and what it means. J. J. Reynolds. Elec Ry J 46:815-18 O 16 '15 Card index increases efficiency of new-business department. Elec R & W Elec'n 66:899-900

Card index increases efficiency of new-business department. Elec R & W Elec'n 66:899-900 My 15 '15 Card records in selling accessories. Horseless Age 35:229-30 F 17 '15 Follow-up card index of new buildings. Elec W 66:206 Jl 24 '15 Where's that pattern? and how to locate it. H. A. Russell. il Foundry 43:263-5 Jl '15 See also Accounting; Files and filing (documents); Records

Cardboard

Where waste newspapers go. Sci Am 111:471 D 5 '14

Carding machinery Stripping mechanism for cards. diag Textile World 50:73 O '15

Carhouses. See Car houses

Caricatures and cartoons
Truman Curtis, cartoonist. H. Harley. il Inland Ptr 56:84-6 O '15

Carlisle, Pennsylvania

Streets

Vitrified-brick pavement on an old macadam base. J: C. Hiteshew. il diag Eng N 72:1262-3 D 24 '14

Carnotite

arnotite
Concentration of carnotite ores. Met & Chem
Eng 13:273 My '15
Extraction and separation of the radioactive
constituents of carnotite. H. M. Plum. Am
Chem Soc J 37:1797-1816 Ag '15
Method of treating carnotite ores. Eng &
Min J 99:864 My 15 '15
Radium: uranium ratio in carnotites. S. C.
Lind and C. F. Whittemore. diags Am Chem
Soc J 36:2966-82 O '14
Radium-uranium ratio in carnotites. S. C.

Radium-uranium ratio in carnotites. S. Lind and C. F. Whittemore, il diags U Bur Mines Tech Pa 88:1-28 '15

Carolina, Clinchfield & Ohio railway Elkhorn extension of the Carolina, Clinch-field & Ohio Ry. il Ry R 56:239-42 F 20 '15 Carpenter shops

Details of a standard portable carpenter shop on construction work, il plans Concrete Cem

6:186 Ap '15 Planning a small carpenter shop. W. S. Wil-kin. il plan Bldg Age 37:35-7 O '15

Carpentry

Sce also Building; Cabinet making; Cars; Doors; Floors; Lathes; Railings; Roofs; Scaffolding; Slide rule; Woodworking machinery

Study and teaching

Training carpenters for the trade at Bridge-port. J. F. Johnson, il Am Ind 15:26-8 Mr '15

See also Commerce; Demurrage; Express companies; Freight; Interstate commerce; Railroads; Shipping; Steamboat lines

Bay State combination car. il diag Elec Ry J 46:854-7, 1068-73 O 23, N 27 '15 Brake shaft drop handle and ratchet, diags Ry Age (Mech ed) 89:43 Ja '15 Buffalo, Rochester & Pittsburgh standard outfit cars, il plans Ry Age 58:1445-7 Je 18

Car control. J. Fitzmorris. Ry Age (Mech ed) 89:71-2 F '15

58:41-2 F 16 Car design from a service standpoint, il diags Elec Ry J 46:578-80 S 18 '15 Cars and locomotives ordered and built in 1914. Ry Age 58:15-20 Ja 1 '15

Cars-Continued

ars—Continued
Cars and locomotives ordered in 1914. Ry R 56: 36-41 Ja 2 '15
Cars at less than cost. N. W. Storer. Elec Ry J 46:635 S 25 '15
Combination car for Kansas interurban line. il Elec Ry J 45:806 Ap 24 '15
Commissary car, Canadian Pacific railway, il plan Ry R 55:707-8 D 12 '14
Curtain fixtures without pinch handles, il Elec Ry J 45:298-9 F 6 '15
Extensible trap door for passenger cars, il plan Elec Ry J 46:116-17 Jl 17 '15; Ry Age 59:207-8 Jl 30 '15; Ry Age (Mech ed) 89:430-1 Ag '15; Ry R 57:268-9 Ag 28 '15
Fireproofing wood for passenger car construction on British railways. Ry R 57:689 N 27 '15
Improvements in Des Moines interurban cars.

27 '15 Improvements in Des Moines interurban cars, il Elec Ry J 46:156-7 Jl 24 '15 Making interurban cars comfortable, diags Elec Ry J 46:834 O 16 '15 Making interurban cars comfortable, diags Elec Ry J 46:834 O 16 '15 Master car builders' 49th annual convention. Elec Ry J 45:1163-4 Je 19 '15 Master car builders' 49th annual convention. Ry R 56:832-42 Je 19 '15 New passenger car equipment Union Pacific R. R. il plans Ry R 56:195-6 F 6 '15 Relative merits of long and short wheel base scale-testing cars. C. A. Briggs, il diags Ry R 57:197-201 Ag 14 '15 Remodeled mail cars for housing government field parties, il plan Ry Age 57:1149 D 18 '14 Salt Lake & Utah railroad, il map Elec Ry J 45:54-5 Ja 2 '15 Semi-steel cars in collision. C. G. Keen, il diag

45:54-5 Ja 2 '15

Semi-steel cars in collision. C. G. Keen. il diag Elec Ry J 45:715-16 Ap 10 '15

Steel frame double truck caboose. Il diags plan Ry Age (Mech ed) 89:301-4 Je '15

Steel frame passenger equipment with wood finish; new Grand Trunk suburban cars. il diags Ry Age 58:753-5 Ap 2 '15; Same. Ry Age (Mech ed) 89:174-8 Ap '15

To find maximum overhang of car on curve at platform. L. C. Jordan. Eng Rec 71:340

Mr 13 '15

U. S. Bureau of standards tost valight.

Mr 13 '15
U. S. Bureau of standards test weight car no.
2. il Ry R 57:483-4 O 16 '15
Upkeep of railway carriages, Engineer 120:1713 Ag 20 '15
Use of current for operating crane to remove trucks from under car bodies, R. E. Hewitt, il Elec Ry J 46:638 S 25 '15

Veneered steel for interior finish of passenger cars, Canadian Pacific Ry. il Ry R 55:724 D 12 '14; Same. Ry Age 57:1087-8 D 11 '14

See also Air brakes; Automobiles; Bag-gage and express cars; Bath cars; Brake beams; Brakeshafts; Buffet cars; Car cleanheams; Brakeshafts; Buffet cars; Car cleaning; Car couplings; Car heating; Car houses; Car lighting; Car painting; Car roofs; Car trucks; Car wheels; Chapel cars; Draft gears; Dynamometer cars; Electric railroads—Rolling stock; Freight car service; Freight cars; Hospital cars; Motor cars (railroad); Refrigerator cars; Sleeping cars; Street cars; Tank cars

## Bearings

Ball bearings on electric railway cars; abstract. R. Zehnder-Spoerry, diags Am Soc M E J 37:230-1 Ap '15

Economies of the light car and of ball bearings. A. V. Farr. Elec Ry J 46:239-40 Ag 7 '15 Lubrication of car journals. W. A. Clark. Ry Age (Mech ed) 89:19-20 Ja '15

Need of standard railroad car-bearing alloy. R. R. Clarke. Foundry 43:457-8 N '15 Street railway service being inaugurated in Miami, Fla., with storage-battery cars. il diag Elec Ry J 46:920-1 O 30 '15

Use of ball bearings on Swedish railways. diags Ry R 56:600 My 1 '15

### Cleaning

See Car cleaning

#### Disinfection

Disinfectant arrangement for passenger cars. diags Ry Age (Mech ed) 89:466-7 S '15

### Painting

See Car painting

Repair

Repair

Car maintenance on a definite cost basis. K. C. Schluss. Elec Ry J 46:568-9 S 18 '15

Car maintenance on the San Francisco-Oakland terminal railways. G: St. Pierre, il diags Elec Ry J 46:527-30 S 18 '15

Compensation for car repairs; Master car builders' association committee report. Ry R 56:835-6 Je 19 '15

Maintenance of 1500-volt d. c. cars by the Southern Pacific company. E. Sears. Il Elec Ry J 46:551-4 S 18 '15

Maintenance of 1200-volt d. c. cars by the Oregon electric railway. D. I. Clough. Il Elec Ry J 46:555-6 S 18 '15

Maintenance of 1200-volt d. c. cars by the Southern Pacific company. R. E. Hewitt. Il Elec Ry J 46:546-8 S 18 '15

See also Railroads—Shops

See also Railroads-Shops

# Ventilation

See Car ventilation

Cars, Caboose
Eight-wheel caboose with steel underframe,
E. F. Givin, il diags Ry Age (Mech ed) 89:
231-3 My '15

Eric caboose with steel center sills. il diags plan Ry Age (Mech ed) 89:25-8 Ja '15

Steel frame caboose, Buffalo, Rochester & Pittsburgh Ry, il diags Ry R 56:270-2 F 27

eel frame double truck caboose, Buffalo, Rochester & Pittsburgh. il diags plan Ry Age (Mech ed) 89:301-4 Je '15 Steel

Cars, Chapel. See Chapel cars

Cars (derrick)

Derrick car for elevated-railway reconstruc-tion. J. M. Ryan. il diag Eng N 73:986-7 My 20 '15

Seventy-nine-ton derrick car lowers itself 50 feet in twenty-five minutes. A. S. Beale. il Eng Rec 72:78-9 Jl 17 '15

Cars, Dining. See Dining cars

Cars, Freight. See Freight cars

Cars, Hospital. See Hospital cars Cars (inspection)

Conducting track inspection on the Grand Trunk, il Ry Age 57:1145-7 D 18 '14 Cars, Kitchen. See Kitchen cars

Cars (line)

Pillar crane car for track work. E. M. T. Ryder, il Elec Ry J 45:763 Ap 17 '15

Three-in-one car. E. C. Sherwood, il diag Elec Ry J 45:1121-3 Je 12 '15

Cars, Military

New war cars for our army, il Sci Am 113:98 JI 31 '15

Cars, Refrigerator. See Refrigerator cars

Cars (section)

G. R. Morrison. Ry Age 59:527-8 S 17 '15; Same. Ry R 57:345-6 S 11 '15 Cars (spreader)

Improvements in bank spreader cars. Ry R 56:434 Mr 27 '15

Cars, Steel Way. il Elec Ry J 46:27-8 Jl 3 '15

All-steel one-man car. il Elec Ry J 46:72-3 Jl

All-steel passenger cars for the Pacific electric railway, F. F. Small, il diags Elec Ry J 46:488-92 S 18 '15

American steel cars built for Russian railways. il Eng N 74:951 N 11 '15

Analysis of stresses in Chicago elevated steel car. H. A. Johnson, diag Elec Ry J 44:1299-1300 D 12 '14

British-all-steel kitchen cars, il diags Ry Age (Mech ed) 89:178-82 Ap '15

Center-entrance cars for suburban service. il plan Elec Ry J 46:282-4 Ag 14 '15

Considerations affecting the type of center sills in steel passenger equipment. L. K. Sillcox. diags Ry Age (Mech ed) 89:227-31 Sillcox. My '15

Cars, Steel Continued

Design and operation of the new shop for building steel freight and passenger cars of the Canadian Pacific Ry., at Montreal. L. C. Ord. il diags plan Eng & Contr 42:406-11 O Ord. il

Design of steel passenger equipment. V: W. Zilen. diag Ry Age (Mech ed) 89:459-61, 515-16 S-O '15

Jersey Central steel baggage and mail equipment, il diags Ry Age 58:301-4 F 19 '15; Same, Ry Age (Mech ed) 89:123-7 Mr '15 Jersey Central steel passenger cars, il diags plan Ry Age (Mech ed) 88:625-9 D '14 Light-weight car for Cleveland & Eastern traction company, il Elec Ry J 46:30-1 Jl 3

traction company, il Elec Ry J 46:30-1 Jl 3 '15Light-weight steel interurban car of the Toledo, Fostoria & Findlay railway, il plan Elec
Ry J 45:947-8 My 15 '15
Long Island railroad adopts light, steel trailers, il diags Elec Ry J 46:136-8 Jl 24 '15
Long Island steel suburban cars, il diags Ry
Age (Mech ed) 89:402-6 Ag '15; Same, Ry
Age (Mech ed) 89:402-6 Ag '15; Same, Ry
Age 59:241-4 Ag 6 '15
New subway and elevated car of the New
York municipal railway corporation, il diags
Ry R 56:208-13 F 13 '15
Northern Pacific passenger cars, il diags Ry
Age (Mech ed) 89:517-22 O '15; Same cond,
Ry Age 59:333-7 O 22 '15; Same, Ry Age 59:397-8 Ag 27 '15; Same, Ry Age (Mech
ed) 89:427-8 Ag '15
Pressed-steel cars for the Chicago elevated, il
diags Elec Ry J 44:1234-9 D 5 '14
Railway safety and railway economics. Sci Am
112:46 Ja 9 '15
Riveting in steel car construction, H. A. Hatfield, il diags Ry Age (Mech ed) 89:33-6, 8790 Ja-F '15
Sand blasting steel cars, diags Ry Age (Mech
ed) 89:376-7 Jl '15; Same cond, Ry Age 59:
104-5 Jl 16 '15
Steel and steel underframe passenger train
aguinment' statistics of progress and cost

Steel and steel underframe passenger train equipment; statistics of progress and cost. Ry R 56:705 My 22 '15; Ry Age (Mech ed) 89:299-300 Je '15

Steel car design from a protection standpoint. J: D. Wright. Ry Age (Mech ed) 89:525-6 J: D. O '15

Steel cars for Chicago & Milwaukee electric railroad, il diags Elec Ry J 46:388-91 S 4

Steel cars of the arch roof type, il diags plans Ry Age (Mech ed) 89:349-56 Jl '15

Steel coaches for the Santa Fe, il diags Ry Age (Mech ed) 89:21-5 Ja '15

Steel dynamo-baggage cars for the Union Pacific R. R. il diag Ry R 56:469 Ap 3 '15 Steel parlor cars for Waterloo-Cedar Rapids line, il plan Elec Ry J 45:932-4 My 15 '15

Steel passenger equipment for the Union cific. il diags Ry Age 58:1475-9 Je 25 '1

Steel suburban cars for the Erie. il diags Ry Age (Mech ed) 89:356-8 Jl '15; Elec Ry J 45: 1102-5 Je 12 '15; Eng N 73:1142-4 Je 10 '15; Ry Age 58:1243-5 Je 11 '15

Stress analysis of the Chicago steel car. E. W. Rettger and S. G. George. Elec Ry J 45:291-2 F 6 '15

# Painting

See Car painting

Repair -

Steel cars on the Long Island. il Elec Ry J 45:566-70 Mr 20 '15 Steel

Cars, Subway Electrical equipment of Belmont tunnel cars. il Elec Ry J 45:764-5 Ap 17 '15

New subway and elevated car of the New York municipal railway corporation, il diags Ry R 56:208-13 F 13 '15 Carson lake

Unwatering Carson lake, L. D. Davenport. il map Eng & Min J 98:1069-70 D 19 '14

Cartels. See Trusts, Industrial Cartography. See Maps

Cartoons. See Caricatures and cartoons

Cartridge cases
Annealing of brass cartridge cases. L. J.
Krom. il diags Metal Ind n s 13:359-63 S

Making cartridge cases. D. T. Hamilton. il diags Mach 21:651-6 Ap '15; Excerpt. Sci Am S 80:29-30 Jl 10 '15

Cartridges

Cartridges for war. E: C. Crossman. Sci Am 113:219+ S 4 '15

See also Bullets

Carty, J. J. Portrait. Power 42:66 Jl 13 '15

Case hardening

ase hardening
Carburization and heat-treatment. J. G. Ayers, jr. il Mach 22:17-23 S '15
Case-hardening process for tool steel. R. A. Millholland. Metal Work 84:688-9 N 26 '15; Same. Iron Age 96:1166-7 N 18 '15
Case-hardening retorts and furnaces. R. A. Millholland. il Iron Age 96:1111-14 N 11 '15
Gas as a case-hardening agent. A. H. White and H. T. Wood. bibliog il Am Gas Light J 103:259-63, 266 O 25 '15
Materials employed in case hardening. R. A. Millholland. Iron Age 96:1041-2 N 4 '15
Protection of parts in case hardening. Iron Age 95:304-5 F 4 '15
Use of copper electroplate in localized case-hardening. W. Paxton. diags Mach 21:499 F '15

See also Steel, Hardening of

Cast iron

ast iron

Aluminum or iron crank cases; a comparison of the two materials on the bases of weight, strength and cost. V. I. Moncrieff. Horseless Age 35:582-3 Ap 28 '15

Annealing effect on light gray iron castings. G. S. Evans. il Foundry 43:219-21 Je '15

Annealing gray iron castings. il Foundry 43:

Annealing gray iron castings. il Foundry 43: 188 My '15
Chill and shrinkage of cast iron, R. A. Pitman. Foundry 43:304 Ag '15
Control of chill in cast iron, considering the elements effective in the manufacture of malleable castings and chilled car wheels. G. M. Thrasher, il Am Inst Min E Bul 106: 2129-38 O '15; Same. Foundry 43:491-3+ D '15; Same. Iron Tr R 57:1171-3+ D 16 '15; Except (Natural chill of cast iron). Met & Chem Eng 13:39-40 Ja '15
Corrodibility of cast iron and steel. J. N. Friend and C. W. Marshall. Iron Age 95:1114-15 My 20 '15
Corrosion of steel and cast iron compared. R. C. McWane and H. Y. Carson. il Foundry 13:167-9 N '15
Evolution of the malleable process. J. P. Pero and J. C. Nulsen. Iron Age 96:1168-70 N 18 '15
Hard iron, W. J. Keep. Foundry 43:359 S '15

Hard iron. W. J. Keep. Foundry 43:359 S '15
Malleable castings specifications. diag Iron
Tr R 57:46-7 Jl 1 '15
Malleable iron castings for the automobile
industry. R: Moldenke. Horseless Age 35:6972 Ja 13 '15; Same. Iron Tr R 56:221-4; Discussion. E. Touceda. 56:224+ Ja 28 '15
Manufacture and uses of malleable iron. J. P.
Pero. Foundry 43:141-3 Ap '15
Phosphorus in malleable castings. E. Touceda.
il Iron Tr R 57:634-6 S 30 '15; Same. Foundry
43:446-9 N '15; Same cond. Iron Age 96:924-6
O 21 '15
Physical properties vs. analysis. W. J. Keep.

O 21 '15
Physical properties vs. analysis. W. J. Keep.
Foundry 43:120 Mr '15
Practice of the oxy-acetylene welding process. S. W. Miller. il Mach 22:108-17 O '15
Recent developments in cast-iron manufacture.
J. E. Johnson, jr. J Fr Inst 179:59-93, 171-200
Ja-F '15; Discussion. 179:200-13 F '15
Researches in annealing malleable castings.
O. W. Storey. il Foundry 42:474-8 D '14
Specifications for malleable iron. E. Touceda.
Iron Tr R 56:615-16 Mr 25 '15
Standard specifications for the foundryman.
Foundry 13:258-61 Jl '15
Sulphur in malleable cast iron, R. H. Smith.

Foundry 13:25x-61 Jl '15
Sulphur in malleable cast iron, R. H. Smith.
Iron Age 96:1235 N 25 '15
Surface of molten cast iron, R. A. Pitman.
Foundry 43:365 S '15
Vanadium from oxide to steel, W. F.
Bleecker and W. L. Morrison, Met & Chem
Eng 13:492-4 Ag '15

Cast iron-Continued

Varying silicon and carbon, A. L. Pollard, Iron Age 95:121 Ja 7 '15

See also Car wheels; Chilled iron; Foundry practice; Iron; Iron founding; Iron metaliurgy; Pig iron; Spiegeleisen

Testina

Testing

Bending elasticity of cast iron. A. Ono. Am

Soc M E J 37:290-1 My '15

Tentative methods—sampling pig and cast
iron. Foundry 48:259-60 Jl '15

Testing the hardness of iron castings. G. S.
Evans. il diag Iron Age 96:8-10 Jl 1 '15

Tests of malleable iron after skin has been
removed. E. Touceda. il Iron Tr R 55:5846+ S 24 '14; Same. Foundry 48:13-15 Ja '15;
Same cond. Iron Age 94:948-50 O 22 '14;
Abstract. Am Soc M E J 36:0196-7 O '14

Tests of vanadium iron castings. il Foundry
48:179-80 My '15; Same. Iron 'Tr R 57:221-2
Jl 29 '15

Jl 29 '15

Tests on the combined bending and torsional strength of cast iron. T. Matsumura and G. Hamabe. Am Soc M E J 37:347 Je '15

Preserving caste in English hospitals, Sci Am S 80:326 N 20 '15

Casting machines

asting machines
Continuous casting machine. R: C. Patterson.
diag Metal Ind n s 13:254-5 Je '15
Continuous rod casting machine. il Sci Am 113:
165+ Ag 21 '15
Continuous rod-casting process; construction
and operation of a casting machine designed
to simplify the manufacture of rods and
wire. E; K. Hammond, il diag Mach 21:7657 My '15
Cost of casting machines for converter plant.
E. H. Jones. Am Inst Min E Bul 91:1594-5
Jl '14; Same. Eng & Min J 98:1047-8 D 12
'14

Mellen rod-casting machine. R. C. Patterson, jr. il Am Inst Min E Bul 101:919-25 My '15; Same. Iron Age 95:996-8 My 6 '15; Same. Iron Tr R 57:446-7+ S 2 '15; Abstract. Am Soc M E J 37:316-7 Je '15; Abstract. Eng M 49:593-4 Jl '15

Castles

Plans and elevations for a castle, J: W. Morton. Bldg Age 37:54-6 O '15

Castor beans

Studies on enzyme action: the esterase and lipase of castor beans. K. G: Falk and K. Sugiura. Am Chem Soc J 37:217-30 Ja '15 Studies on enzyme action; some experiments with castor bean urease. K. G: Falk and K. Sugiura. Am Chem Soc J 36:2166-70 O '14

Castor oil Physical qualities of castor oil. P. (Vetty. Automobile 33:500-1 S 16 '15

Casts, Plaster. See Plaster casts

Cataloging

See also Classification; Indexing

Goods that give service which draws trade. il diag Metal Work 83:27-36 Ja 1 '15 How to sell a catalogue. R. C. Fay. Inland Ptr 55:104-6 Ap '15 Trade catalogs—few are useful as now pre-pared. P. B. Tallman. Eng Rec 71:407 Mr 27 '15

Catalysis

atalysis
Catalysis in the gas industry, Sci Am S 79:
125 F 20 '15
Catalytic agents: their relation to modern
methods. Sci Am S 80:53 Jl 24 '15
Hydrogenation of oils and soft fats. Sci Am
S 80:99 Ag 14 '15
Influence of temperature in acid catalysis.
H. S. Taylor. Am Chem Soc J 37:551-7 Mr
'15

Nature of the catalysis in the conversion of the cinchona alkaloids into their toxines. H. C. Biddle. Am Chem Soc J 37:2088-2112

One of the mysteries of chemistry. Sci Am S 78:367-8 D 5 '14

Rate of conversion of cinchonidine into cin-chotoxine, H. C. Biddle and R. H. Butzbach. Am Chem Soc J 37:2082-7 S '15

Rate of conversion of cinchonine into cinchotoxine. H. C. Biddle and O. L. Brauer. Am Chem Soc J 37:2065-82 S '15
Reactions of sodium ethylate with methyl iodide in absolute ethyl alcohol at 25°. H. C. Robertson, jr. and S. F. Acree. Am Chem Soc J 37:1902-9 Ag '15
Reinterpretation of the reactions of sodium methylate and sodium ethylate with 1, 2-dinitrobenzene, and 1, 2, 4-dinitrochlorobenzene and 1, 2, 4-dinitrobromobenzene. S. F. Acree. Am Chem Soc J 37:1909-14 Ag '15
See also Colloids See also Colloids

Bibliography

Bibliography of the chemistry of gas manufacture. W. F. Rittman and M. C. Whitaker. U S Bur Mines Tech Pa 120:17-20 '15

Catch basins. See Sewerage-Catch basins Catenary construction. See Electric railroads—Construction

Caterpillar tractors. See Tractors

Caterpillars

Fighting caterpillars with steam. il Sci Am 112:104 Ja 30'15

Cathode ray tube
Cathode ray tube and its application. M. E.
Tressler. diag Gen Elec R 18:816-20 Ag '15
Characteristics of cathode ray tubes. J. P.
Minton. diags Gen Elec R 18:636-40 Jl '15
Investigation of dielectric losses with the cathode ray tube. J: P. Minton. il Am Inst
E E Pro 34:1115-65 Je '15; Abstract. Elec
W 66:66 Jl 10 '15

Cathode rays

Cathode rays and their properties. J. P. Minton, diags Gen Elec R 18:118-25 F '15
Salts colored by cathode rays. E. Goldstein,
Sci Am S 79:318-19 My 15 '15
Sec also Electrons; X rays

Catskill aqueduct

atskiii aqueduct
Brass in water works construction with special
reference to experience on the Catskill aqueduct: abstracts. A. D. Flinn. Eng & Contr
43:57-8 Ja 20 '15; Metal Ind n s 12:500-2 D '14;
Munic J 37:922-4 D 24 '14
Building the earth embankment for Hill View
reservoir. A. W. Tidd. il plan Eng N 74:500-

<sup>5</sup> S <sup>9</sup> 15 Cast iron submarine aqueduct. il diags Engi-neer 120:176-8, 180 Ag 20 '15 Catskill aqueduct tunneling. il diag Munic J 38:728-9 My 27 '15

City tunnel of the Catskill aqueduct. W. E. Spear, diags plan Eng N 73:56-60, 98-103, 148-53, 194-9 Ja 14-F 4 '15; Excerpt. Eng M 48:598-900 Mr '15

Design and cost of concrete posts used along Catskill aqueduct, diags Eng & Contr 43: 287-8 Mr 31 '15

Electrically operated contractor's plant for building Kensico dam. A. W. Carroll. il Eng Rec 71:18-20 Ja 2 '15

Narrows flexible joint submarine siphon. J: P. Hogan. il diags plans Eng Rec 70:656-9 D 19

lant and methods employed in laying the flexible-jointed Narrows syphon of the Cat-skill aqueduct. S. W. Symons. il Eng & Contr 43:218-19 Mr 10 '15 Plant.

Tunnel, 400 feet below existing bore, replaces short section of damaged Catskill siphon, il diags Eng Rec 71:514-16 Ap 24 '15

Twenty-ton valve lowered down 250-foot shaft in 20 min. R. W. Greenlaw. il Eng Rec 71: 181 F 6 '15

Water main under New York harbor from Brooklyn to Staten Island. J. F. Springer. il diag Munic Eng 49:92-5 S '15

Yardage record at Kensico dam due, in part, to operation of mixers. G: T. Seabury. Eng Rec 71:199 F 13 '15

## Buildings

ynthetic stone as used in the construction of Catskill aqueduct buildings. H. L. Rogers. il diags Concrete Cem 6:125-8, 132-3 Mr '15; Abstract. Eng M 49:272 My '15

Cattle dips. See Dipping fluids, Arsenical

Caucasus

Copper smelting in the Caucasus, map Eng & Min J 99:655-3 Ap 10 '15 In and out of the Caucasus in war time. L. C. David, if Eng & Min J 99:177-80 Mr

Causeways

auseways
Builders of the Galveston causeway tell of the
storm's effect. Eng Rec 72:276 Ag 28 '15
Galveston survives hurricane. il map Eng N
74:424-6 Ag 26 '15
Galveston's sea-wall checks hurricane's devastation. E. B. Van de Greyn. il diags
Eng Rec 72:271-5 Ag 28 '15

Cave deposit. G: J. Young. diag Econ Geol 10: 186-90 F-Mr '15

Cedar

Spanish cedar. il Sci Am S 78:372-3 D 12 '14 Western red cedar men meet. Elec R & Elec'n 66:164 Ja 23 '15

See also Northern white cedar association

Cedar Rapids, Iowa

Bridges

Construction features of the duplicate reinforced concrete arch bridges at Third ave., Cedar Rapids, Iowa. diags Eng & Contr 42:148-50 Ag 12 '14

Cedars Rapids, Quebec Cedars hydro-electric development, St. Law-rence river, il diags plan Eng N 73:566-73, 611-13 Mr 25-Ap 1 '15

Ceilings

Lighting of rooms through translucent glass ceilings; with discussion. E. J. Edwards. il Illum Eng Soc 9:1011-20 no 9 '14

See also Mural painting and decoration; Plaster and plastering

Celestial globes

Celestial globe and tellurian. il Sci Am 113: 61 Jl 17 '15

Celilo canal

Connecting Idaho with the sea; completion of the Celilo canal along the Columbia river. F. W. Vincent, il Sci Am 112;476 My 22 '15

Celife

Thermal insulation of high-temperature equipment. P. A. Boeck, diags Am Inst M Bul 104:1539-50 Ag '15; Discussion, 2513-19 D '15

Cellars

How to drain low cellar, plan Dom Eng 72: 201 Ag 14 '15 Storage cellar built of concrete, P. H. Wilson, il Bldg Age 37:64 Mr '15

See also Basements

Cellon Substitute for glass in automobiles. Sci Am 112:401 My 1 '15

Cellose octacetate

tose and of cellose. C. S. Hudson and J. M. Johnson. Am Chem Soc J 37:1276-80 My '15

Cultivation of living tissues outside the body. Sci Am S 79:147 Mr 6 '15

Celluloid

Contributions of the chemist to the celluloid and nitrocellulose industry, R. C. Schüpp-haus. J Ind & Eng Chem 7:290 Ap '15

Celiulose (hydrate)

New casing for sausages. W. P. Cohoe, E. C. Fox and A. J. Acton, Sci Am 112:235+

Cement

Accounting for cement packages. G. Wilson. J Account 19:198-205 Mr '15
Air analyzer for determining the fineness of cement. J. C. Pearson and W. H. Sligh, il diags U S Bur Stand Tech Pa 48:1-74 '15; Abstract. Eng & Contr 44:352-3 N 3 '15; Except. Eng N 74:475 S 2 '15; Summary. J Fr Inst 179:712-14 Je '15; Summary. Eng Rec 71:737 Je 12 '15
Cement market in Dominican republic. Concrete Cem 6:21 Ja '15
Chemical similarities of hydraulic cements, and reflections thereon. G. B. Upton. Sibley J 29:220-2 Ap '15

Contributions of the chemist to the cement industry, G. S. Brown, J Ind & Eng Chem 7:277-8 Ap '15

Decade's change in output of cementing matethat's, E. C. Eckel, Ling Rec. 19:1-4 D 26 '14 Electric motors in the Portland cement indus-try. Elec W 65:111 Ja 9 '15 Finer grinding and higher SO<sub>3</sub> in Portland cement, P. H. Bates, Eng N 74:138-9 J1 15

High-strength concretes produced through lowering of surface tension of mixing water. N. C. Johnson. il Eng Rec 71:320-4 Mr 13

Hydration of Portland cement. A. A. Klein and A. J. Phillips. pls U S Bur Stand Tech Pa 43:3-71 '14

drestigation of the durability of cement drain tile in alkali soils. R. J. Wig and G. M. Williams. diags pls U S Bur Stand Tech Pa 44:1-56 '15; Excerpts. Concrete Cem agnesis Investigation

7:145-70 '15

Magnesia cement. C. H. B. Burlton. Engineer 119:471-2 Mv 14 '15

Mechanical features of the hydration of Portland cement and the making of concrete as revealed by microscopic study. N. C. Johnson. il Am Soc M E J 37:516-25 S '15; Abstracts. Eng M 49:744-5 Ag '15; Am Gas Light J 103:283-4 N 1 '15; Discussion. Am Soc M E J 37:525-8 S '15

Petrographic study of Portland cement. R. J. Colony. bibliog il Sch Mines Q 36:1-21 N '14 Probable life of Portland cement stucco on metal fabric. Concrete Cem 7:151-5 O '15 Reduced production of Portland cement in 1914. Eng Rec 71:44 Ja 9 '15

Standardization of no. 200 cement sieves.

Standardization of no. 200 cement sieves. R. J. Wig and J. C. Pearson, pls U S Bur Stand Tech Pa 42:1-51 '14

Statement of losses of cement at various prices; table. A. Moyer. Eng Rec 71:783-4 Je 18 '15

Using bulk cement on railway construction work. M. D. Campbell. il Ry Age 58:1441-3 Je 18'15

Why is a barrel the unit of cement measure? Concrete Cem 7:83 Ag '15

See also Concrete; Dental cements; Gunite; Lime; Mortar; Pavements; Stucco; also headings beginning Cement

# Exhibitions

Annual cement show at Chicago, il Bldg Age 37:59-63 Mr '15

Patents

Co-operation in small building development. P. H. Bosworth. Concrete Cem 6:42 Ja '15

Specifications

Standard specifications for cement. Am Gas Light J 103:125 Ag 23 '15

# Testing

See Cement testing

Cement bags. See Cement sacks

Cement clinker

British Portland cement making machinery; cooling of cement clinker. diags Engineer 120:126-8 Ag 6 '15

Constituents of Portland cement clinker, G. A. Rankin, J Ind & Eng Chem 7:466-74 Je '15

Function of ferric oxide in the formation of Portland cement clinker. E: D. Campbell, il J Ind & Eng Chem 7:835-7 O '15

Cement gun Cement gun for relining old brick and ashlar sewers. L. Chivvis. il Eng N 74:939-40 N 11 '15

Cement-gun furnace repairs. Eng & Min J 99:866 My 15 '15

ry, coarse sand best for cement gun in wet climate. Eng Rec 72:491 O 16 '15

Experience with cement guns in levee revetment. W. G. Caples. Eng & Contr 44:397-8 N 17 '15

Cement kilns

British Portland cement making machinery. il diags Engineer 119:372-4, 498-9; 120:81-2 Ap 16, My 21, Jl 23 '15

Cement lining

Method of ming wrought, steel and cast iron pipe with cement, dag Eng & Contr 42:547-8 D 9 '14

Cement machinery

ement machinery
British Portland cement making machinery.
il Engineer 119:151-2, 175-7, 198-201, 246-9,
302-4, 328-30, 348-9, 372-4, 398-400, 424-6, 4483, 448-50, 497-500, 552-1, 504-8, 626-8; 120:
4-6, 32-4, 81-2, 102-5, 126-8, 148-51, 173-6,
195-6, 218-20, 242-3, F 12-26, Mr 12, 26-My
21, Je 4, 18-J1 9, 23-8 10 '15
New goods seen at the cement show, il Bldg
Age 37:60-6 Ap '15

Cement plants British Portland cement making machinery. il diags Engineer 119:328-30, 372-4, 398-400, 424-6, 448-9; 120:81-2, 102-5, 126-8, 148-51, 195-6, 218-20, 242-3 Ap 2, 16-My 7, Jl 23-Ag 13, 27-S 10 '15

13, 27-S 10 '15
Design and construction of a unit-cast mill building in Victoria, B. C. il diag plans Eng & Contr 44:185-6 S 8 '15
Electric drive for economic operation and development of cement mills. J. B. Porter. Am Soc M E J 37:157-8 Mr '15
Electricity in cement manufacture. N. G. Meade. il Elec R & W Elec'n 67:273-5 Ag 14 '15
Extensive couth slippage chute down convert

14 '15
Extensive earth slippage shuts down cement plant of Knickerbocker Portland cement co. il plan Eng N 74:330-2 Ag 12 '15
Fleming dust collecting system. W. C. Hanna. il plan Met & Chem Eng 13:609-12 S 15 '15
Motor drive in European cement works, il Elec R & W Elec'n 66:1050-1 Je 5 '15
Need of studying energy consumption of manufacturing operations. Elec W 66:144 Jl 17 '15

Portland cement industry, C. C. Batchelder, Am Inst E E Pro 34:3947-8 D '15 Pulverized coal burning in the cement indus-try, R. C. Carpenter, il diags plan Am Soc M E J 36:337-46 O '14; Abstract, Ind Eng 14:331-3 Ag '14; Abstract, Colliery 35:529-30 My '15

My '15 Sinking land wrecks cement company's power plant, il Eng Rec 72:179-80 Ag 7 '15 Uflit construction of a Portland cement mill building. D. C. Findley, il diags Concrete C'em 7:79-81 Ag '15 Water-soaked bed of blue clay caused land-slip at cement plant near Hudson, N. Y. D. H. Newland, map Eng Rec 72:253-4 Ag 28 '15

Cement plants, Municipal

Cost of cement, Los Angeles municipal plant. F. C. Finkle; O. E. Clemens. Eng N 73:229

Cement sacks

Cement-sack-cleaning machine pays big divi-dends. Elec Ry J 46:772 O 9 '15 Home-made machine cleans cement bags at big saving. Eng Rec 72:491-2 O 16 '15

Cement testing
British Portland cement making machinery. il
diags Engineer 120:173-6 Ag 20 '15

Cement testing in Hampton trade school, il Bldg Age 37:67 Jl '15

Fallacies in cement testing; abstract. Gadd. Am Soc M E J 37:487-8 Ag '1

Value of the high-pressure steam test of Port-land cements. R. J. Wig and H. A. Davis. il diags U S Bur Stand Tech Pa 47:1-34 '15: Abstracts. J Fr Inst 179:597-9 My '15; Eng N 73:951 My 13 '15; Eng Rec 71:655-6 My 22 '15

Cementing

Cementing a gas well in salt water, diag Concrete Cem 5:154 D '14

See also Grouting

Cements, Dental. See Dental cements

Census

United States

Measuring growth of a state, Sci Am S 79:

Centering machines

haft and forging centering machine. il Iron Age 95:135 Ja 14 '15

Centers. See Street railroads-Track

Central America

See also Latin America

#### Commerce

Exhibit of American manufactures in Salvador, Metal Work 84:429 O 1 '15

Central electric railway accountants' association Annual meeting, Dayton, Ohio, Dec. 11-12, 1914, with abstracts of committee reports and papers. Elec Ry J 44:1334-40 D 19 '14 27th meeting, Indianapolis, June 11-12. Elec Ry J 45:1151-4 Je 19 '15

Central electric railway association Annual convention, Indianapolis, Ind. 25-29. Elec Ry J 45:411-13, 455-61 F 6 '15 Ind., Feb.

Meeting, Indianapolis, Ind., Nov. 18-19. Elec Ry J 46:1075-80 N 27 '15
 November meeting, Indianapolis, Ind. Elec Ry J 46:1038-9 N 20 '15
 Summer meeting, June 17-18. Elec Ry J 45: 1156-9 Je 19 '15

Central of Georgia railway

Abstract of annual report, map Ry Age 59: 883-4 N 12 '15

Central Pacific railroad

Mr. Kruttschnitt testifies in dissolution suit.

Ry R 56:344-5 Mr 13 '15

Central station business. See Electric service

Central station companies. See Electric service companies

Central station heating. See Heating from central stations

Central station rates. See Electric power-Rates Central stations. See Electric plants-Central

Central supply association
67th meeting, Chicago, Feb. 24; list of members represented. Dom Eng 70:283-4 F 27

Centrifugal fans. See Fans, Mechanical

Centrifugal machines Centrifugals; abstract. G. Barnick. diag Met & Chem Eng 13:507-8 Ag '15

Centrifugal pumps. See Pumps, Centrifugal Cephalin

Brain cephalin; distribution of the nitrogen-eous hydrolysis products of cephalin. C. G. MacArthur. Am Chem Soc J 36:2397-401

Ceramics. See Pottery

Certified public accountants. See Accountants,

Cesium alum
Cesium alum and its properties. E: Hart and
H: B. Huselton. Am Chem Soc J 36:2082-4
O '14

Cesspools

Sewage disposal methods in country places. T. Horton, diags Metal Work 84:679-81 N 26 '15

Cevadine. See Veratrine

Ceylon

Pearl fisheries of Ceylon, R. I. Geare, il Sci Am S 79:4-5 Ja 2 '15

### Commerce

British India. il U S Sp Cons Rep 72:573-634

Chain gear

hain gear
Chain data for motor drives, table Elec W 66:
470 Ag 28 '15
Chain drive of 5000-hp, for Ox-Bow hydroelectric plant on the Snake river, diag
Power 42:456 S 28 '15; Same, Eng N 74:544-5
S 16 '15; Abstract, Engineer 120:340 O 8 '15
Link-belt silent chain, C. R. Weiss, Am Inst
E E Pro 34:2701-5 N '15
Variable-speed pumping plant for a drainage
district, diags Eng N 74:918-19 N 11 '15

Chains

Care and use 21:297-8 D '14 of hoisting accessories. Mach

Care of chains. Eng & Contr 44:230-1 S 22 '15 Crane and chain accidents: abstract. Ind Eng 14:411-12 O '14 Chains - Continued

hains—Continued
Making sprocket chain without waste, il Iron
Age 95:1105-9 My 20 '15
Manufacture of chain, F. H. Mayoh, il diags
Mach 21:719-23, 817-20 My-Je '15
Safety in crane chains, E. B. Morgan, Iron
Age 96:1116-17 N 11 '15
Testing Locke steel sprocket chain, E: K.
Hammond, il Mach 22:24-7 S '15

See also Chain gears; Slings and hitches

## Specifications

Specifications for chain, Iron Tr R 57:45-6 Jl 1 '15

Chair factories

Electricity in chair manufacturing. il Elec R & W Elec'n 66:979-82 My 29 '15

Chairs in the Hotel Statler, Detroit. il Arch & Bldg 47:18+ Mr '15

Chalcocite

halcocite
Origin and occurrence of certain crystallographic intergrowths. J. Segall. 2 pls Econ Geol 10:462-70 Jl '15
Temperatures that obtain in zones of chalcocitization. W. H. Emmons. Econ Geol 10: 151-60 F '15

Chalk as fuel

Coal substitutes; use of chalk fuel and peat proposed in England. Sci Am S 79:352 My 29 '15

Chamber of commerce of the United States Business questions considered. Iron Age 95: 354-5 F 11 '15

Third annual 29-31 Mr meeting, Feb. 3-5. Am Ind 15:

Chambers of commerce Commercial organizations in France, A. J. Wolfe, U S Bur For & Dom Com 98:28-49

Commercial organizations in Switzerland and

the Swiss department of commerce. A. J. Wolfe. U S Bur For & Dom Com 101:1-28 '15 Commercial organizations in the United Kingdom with a description of British manufacturers' and employers' organizations. A. J. Wolfe. U S Bur For & Dom Com 102:8-28 '15

Channels

eargrass Creek storm-water channel at Louisville, Ky. J. H. Kimball, il diag plan Eng N 72:1256-60 D 24'14 Beargrass

See also Rivers; Stream measurement; Waterways

Chapel cars

Chapel cars for church extension work, il plans Ry Age 58:825-6 Ap 16 '15

Stone chapel for the suburbs, il plans Bldg Age 37:51-7 N '15

Chapple publishing company
Electricity in magazine publishing, il Elec R
& W Elec'n 66:105-7 Ja 16 '15

Character

Antecedents of the study of character and temperament. J. Jastrow. Sci Am S 80:191-2

Modern psychology; the present study of character and temperament, J. Jastrow, Sci Am S 80:306-7 N 13 '15 Relation of phrenology to the study of char-acter, Sci Am S 80:354-5 D 4 '15

Charcoal

Charcoal as cupola fuel. Foundry 43:365 S '15 Charcoal as fuel for cupola melting. W. J. Keep. Foundry 43:303-4 Ag '15 Thermal principles of the blast furnace. J. E. Johnson, jr. Met & Chem Eng 13:833-40 N

See also Animal charcoal

Charging machines Magnetic skelp charging machine, il diags Iron Age 94:1483-4 D 31 '14

Charities

See also Almshouses

# Charleston, South Carolina

Navy yard

Concrete pile and cylinder foundations at Charleston, il diag Eng N 74:926-9 N 11 '15

Torpedo-boat berth at the Charleston navy yard, il plan Eng N 74:872-3 N 4 '15

#### Wharves

Export coal terminal of the Southern railway at Charleston, S. C. il Ry R 57:620-1 N 13 '15

Charleston, West Virginia
Wood fiber and asphalt as paving materials,
il Munic Eng 48:292-3 My '15

Charlock. See Mustard seed

Charpy test
Charpy impact test on treated steels. J. J.
Thomas. il Iron Age 96:138-40 Jl 15 '15

Constructing logarithmic charts for hydraulic formulas. L. G. Hall. Eng & Contr 44:31-2

Sec also Graphic methods

Chatham, Massachusetts

and plans. Brickb 24:259-60 O '15

Checks

Cheques and drafts. S. Walton. J Account 20: 230-3 S'15

Chelura

Marine wood borers: little known crustaceans of destructive habits, C. H. Truesdale, il Sci Am S 78:356-7 D 5 '14

Chemical apparatus Apparatus for determining sulphur in gas. E. R. Weaver and J. D. Edwards, diag Am Gas Light J 103:108 Ag 16 '15; Same. J Ind & Eng Chem 7:620-1 Jl '15

& Eng Chem 7:620-1 Jl '15

Apparatus for the concentration of sulphuric acid. W: Mason, diags Met & Chem Eng 13: 17-18 Ja '15

Apparatus for the study of reactions between gases and liquids. E. E. Reid, diag Am Chem Soc J 37:2112-14 S '15

Bihn-Jones automatic air device for raising or handling large quantities of liquids, diags Met & Chem Eng 13:876-7 N 15 '15

Bottle filling alarm. E. J. Hall. il Met & Chem Eng 13:347 Je '15; Same, Sci Am S 80:284

O 30 '15

Ether recovery tube. J. M. Pickel, diag. I

O 30 15

Ether recovery tube. J. M. Pickel. diag J Ind & Eng Chem 7:236 Mr '15

Fused silica dishes for the concentration of sulphuric acid. A. E. Marshall. diag Met & Chem Eng 13:136-7 Mr '15

Heat transmission capacity of a silica dish. W. K. Lewis. il diag J Ind & Eng Chem 7: 410-14 My '15

Modified Kipp generator. T. Cohen. diags Am Chem Soc J 37:145-6 Ja '15

Rapid method for washing gold beads. W: S. Black. il Eng & Min J 98:1141-2 D 26 '14

Senfrot chemical injector. diag J Ind & Eng Chem 7:354 Ap '15

Simple stone-frame chemical hood. E. R.

Simple stone-frame chemical hood, E. R. Weaver, il diags Am Chem Soc J 37:1726-9

Titration table. R. S. Potter and R. S. Snyder. il J Ind & Eng Chem 7:45-6 Ja '15

Use of hydrometallurgical apparatus in chemical engineering. J; V. N. Dorr. il diags J Ind & Eng Chem 7:119-30 F '15; Same. Met & Chem Eng 13:55-9, 91-8 Ja-F '15

See also Burets; Fat extraction apparatus; Pipets; Pippettometers; Stopcocks; Viscosimeters; Volumetric apparatus

Chemical elements

Evolution of the elements; the evidence of the stars. J: W. N. Sullivan. Sci Am S 79:282 stars. J: My 1 '15

Search for an alkali element of higher atomic weight than cesium. G. P. Baxter. Am Chem Soc J 37:286-8 F '15

See also Atomic weights; Metals; Valence; also names of elements, e. g. Argon, Carbon, Helium, Nitrogen, Oxygen, Radium

Chemical engineering

Broader applications of chemistry by the municipality. H. W. Mahr. J Ind & Eng Chem 6:1030-2 D '14

Chemical engineering; abstract. 6 Met & Chem Eng 13:545-6 S 1

Chemical engineering on the Bay State street railway. Elec Ry J 45:30-2 Ja 9 '15

Chemical engineering-Continued

Chemical engineering versus engineering chemistry. C: S. Palmer. Met & Chem Eng 13: 203 Ap 15 Columbia university establishes a separate

department of chemical engineering. Met

Co-operation between university and industry.

Met & Chem Eng 13:885-7 D 1 '15

See also Chemistry, Technical; Drying; Metallurgy; Waste products

Chemical engineers, American institute of See American institute of chemical engineers

Chemical engines. See Fire engines, Motor

Chemical equilibrium

Equilibrium between carbon oxysulfide, car-bon monoxide and sulfur. G. N. Lewis and W: N. Lacy. diag Am Chem Soc J 37:1976-83 S '15

equilibrium in the system: lead acetate, lead oxide, and water, at 25°. R: F. Jackson. Am Chem Soc J 36:2346-57 N '14; Same. U S Bur Stand Bul 11:331-45 My 10 '15

Bur Stand Bul 11:331-45 My 10 '15

Chemical industries
Accident prevention in the chemical industries.
F: W. Keough. Met & Chem Eng 13:781-4
O 15 '15; Excerpts. Am Ind 16:23-4 N '15
Aspects of some chemical industries, in the United States, today. E: Gudeman. J Ind & Eng Chem 7:151-5 F '15
Chemical industries of Austria-Hungary and the war; abstract. E: Donath and G. Ulrich.
Met & Chem Eng 13:639-40 S 15 '15
Chemical industries of Germany. P. F. Frankland. Met & Chem Eng 13:378-87 Je '15;
Same. Sci Am S 79:389-90, 402-3 Je 19-26 '15
Chemical industry and German competition.
Engineer 119:90 Ja 22 '15
Chemical trade and the war. Engineer 120:379
O 22 '15

O 22 '15
Chemical trade of the United States in 1914.
J Ind & Eng Chem 7:629-30 Jl '15
Chemical trade situation in Germany and Great
Britain. Met & Chem Eng 13:59-61 Ja '15
Coal-tar chemical industry in Germany and
America. Sci Am S 80:240 O 9 '15
Co-partnership in chemical industries. W. H.
Lever. Engineer 120:91 Jl 23 '15
Developments in German-American trade in
chemicals. J Ind & Eng Chem 7:73 Ja '15
Doing without Europe. Sci Am 112:176 F 20
'15

Effect of the war on American industries. E: E. Pratt. Sci Am 113:230 S 11 '15; Same cond. (Opportunities for the American chemical industry) Met & Chem Eng 13:729-31

Effect of the war upon the American chemical industries. J. H. James. Eng Soc W Pa 31:381-400; Discussion. 31:400-16 Je '15
Foreign markets for American chemicals. T: H. Norton. Met & Chem Eng 13:758-62 O

German chemical industry and the war. Eng & Min J 99:774-5 My 1 '15
Government co-operation with our industries.
Sci Am 112:99 Ja 30 '15
Hearing of the proposed amendment of the patent laws. L. H. Backeland and others.
Met & Chem Eng 13:76-81 F '15
Manchester meeting of the Society of chemical industry. Met & Chem Eng 13:543-6 S 1 '15

Report of the Chemical and dyestuff committee of the New York section of the American chemical society. Met & Chem Eng 12:753-6

Research and industry. Sci Am 112:616+ Je 19

Resources and possibilities of chemical industry in the Southwest. E. Baruch. Met & Chem Eng 13:604-8 S 15 '15

Chem Eng 13:604-8 S 15 '15
Status of the chemical industries in the United
States at the end of 1915. I. F. Stone. J Ind
& Eng Chem 7:991-3 N '15; Same. Sci Am
S 80:286-7 O 30 '15; Abstract. Met & Chem
Eng 13:710, 829 O 15, N 15 '15
War and our chemical industries; symposium;
with discussion. J Ind & Eng Chem 7:59-64
Ja '15

Ja '15
War and the chemical industry. W: H. Nichols.
J Ind & Eng Chem 7:131-6 F '15
War and the chemical trade. Engineer 119:115
Ja 29 '15

What Germany is doing in the chemical and metallurgical industries. Eng & Min J 99: 829 My 8 '15; Same cond. Sci Am S 80:5 Jl 829 My 8 3 '15

See also Chemical research; Chemicals Chemistry, Technical; Dye industry; Potash Chemicals:

#### Exhibitions

National exposition of chemical industries; summary of exhibits and lists of papers read. il Met & Chem Eng 13:690-700, 734-5 O 1-15

Chemical industries, National exposition of. Son National exposition of chemical industries

Chemical industry, Society of. See Society of chemical industry

Chemical laboratories
Chemical department of the Illinois traction
system. N. R. Beagle. Elec Ry J 45:423 F

Chemical patents

Application for and prosecution of applications for United States letters patent. S. C. Mastick. J Ind & Eng Chem 7:874-82 O '15

Coal-tar dyes and the Paige bill; compulsory working of patents. B. C. Hesse. J Ind & Eng Chem 7:963-74; Discussion, H. E. Stonebraker; B. C. Hesse. 7:974-8 N '15

Contractual rights relating to letters patent; Actions for infringements. S. C. Mastick. J Ind & Eng Chem 7:984-91 N '15

Hearing of the proposed amendment of the patent laws. L. H. Backeland and others. Met & Chem Eng 13:76-81 F '15

Theory and statement of the law relating to patents generally and to patents for compositions of matter and chemical processes specifically. S. C. Mastick. J Ind & Eng Chem 7:789-97 S '15

Chemical reaction

Chemical reaction

Action of trioxymethylene on p-xylene in the presence of aluminum chloride. R. C. Huston and D. T. Ewing. Am Chem Soc J 37: 2394-9, 2401 O '15
Addition compounds of organic substances

ton and D. T. Ewing. Am Chem Soc J 37: 2394-9, 2401 O '15
Addition compounds of organic substances with sulfuric acid. J. Kendall and C. D. Carpenter. Am Chem Soc J 36:2498-517 D '14
Chemical reactions at low pressures. I. Langmuir. Am Chem Soc J 37:1139-67 My '15; Abstract. J Ind & Eng Chem 7:349-51 Ap '15; Abstract. Met & Chem Eng 13:244-6 Ap '15
Chemical reactions in anhydrous hydrazine.
T. W. B. Welsh and H. J. Broderson. diags Am Chem Soc J 37:825-32 Ap '15
Electron conception of valence: the theory of electrolytic dissociation and chemical action.
K. G: Falk and J. M. Nelson. Am Chem Soc J 37:1732-48 Ji '15
Interaction of hydrogen and chlorine under the influence of alpha particles. H. S. Taylor. diags Am Chem Soc J 37:24-38 Ja '15
Oxidation and reduction without the addition of acid; the reaction between ferrous sulfate and potassium dichromate. M. Neidle and J. C. Witt. Am Chem Soc J 37:2360-8 O '15

Reactions in liquid ammonia. E: C. Franklin, Am Chem Soc J 37:2279-95 O '15
Reactions of sodium ethylate with methyl iodide in absolute ethyl alcohol at 25°. H. C. Robertson, jr. and S. F. Acree. Am Chem Soc J 37:1902-9 Ag '15
Reinterpretation of the reactions of sodium methylate and sodium ethylate with 1, 2-dinitrobenzene, and 1, 2, 4-dinitrobenzene. S. F. Acree. Am Chem Soc J 37:1909-14 Ag '15

Study of the reactions of sodium malonic ester. C. L. Jackson and F. C. Whitmore Am Chem Soc J 37:1522-37, 1915-34 Je, Ag '19

Theory of chemical reaction and reactivity. E. C. C. Baly. Am Chem Soc J 37:979-93 My '15

See also Chemical reagents

Chemical reagents

Nephelometric estimation of phosphorus, P. A. Kober and G. Egerer, Am Chem Soc J 37: 2373-81 O '15

Reagents for use in gas analysis; alkaline pyrogallol. R. P. Anderson, diag J Ind & Eng Chem 7:587-96 Jl '15

Chemical reduction. See Reduction, Chemical

Chemical research

Coöperation in matters chemical; presidential address. C: H. Herty. Am Chem Soc J 37: 2231-46 O '15

Development of chemical research in America. I. Remsen. Am Chem Soc J 37:1-7 Ja '15 Research in chemical industry. C. F. Burgess. Met & Chem Eng 13:921 D 1 '15

See also Chemical laboratories; Chemistry, Technical

Chemicals

Advance in chemical prices due to the war. Eng & Min J 100:831 N 20 '15 Balance of trade in chemicals between the United States and Germany in 1913. J Ind & Eng Chem 6:1034-5 D '14

See also Chemical industries

#### Statistics

Need of revised chemical statistics. B. C. Hesse, J Ind & Eng Chem 7:58-9 Ja '15

Chemistry

See also Acids; Air; Alkalies; Assaying; Atomic weights; Atoms; Catalysis; Combustion; Crystallography; Dissociation; Earths, Rare; Electrochemistry; Evaporation; Gases; Hydrates; Indicators and test papers; Ions; Metallurgy; Photochemistry; Radioactivity; Reduction, Chemical; Salts; Spectrum analysis; Solution (chemistry); Stereochemistry; Substitution (chemistry); Thermochemistry; also headings beginning Chemical and names of chemical elements and substances

### Apparatus

See Chemical apparatus

Study and teaching

Recent tendencies in high school chemistry, R. H. Bradbury. J Fr Inst 180:449-61 O '15

Chemistry, Analytic Electro-titrametric method and its application Electro-titrametric method and its application Electro-titrametric method and its application to general analytical chemistry. F. H. Hesselink van Suchtelen and A. Itano. Am Chem Soc J 36:1793-1803 S '14
Influence of hydroxy acids and lactones upon determinations of the chemical constants of fatty acids. C. A. Browne. J Ind & Eng Chem 7:30-4 Ja '15
Results of some co-operative work on determination of sulfur in pyrites, H. C. Moore, J Ind & Eng Chem 7:634-6 Jl '15

Two methods of separation of the metals of the alkaline-earth group. A. G. Paterson. Am Chem Soc J 37:2346-52 O '15

Use of the interferometer for the analysis of solutions. L. H. Adams. diags Am Chem Soc J 37:1181-94 My '15

See also Assaying; Drugs—Analysis; Electrolysis; Gas analysis; Gunning-copper method; Soil analysis; Volumetric analysis; also names of substances analyzed, e. g. Coal—Analysis, Steel—Analysis, Water—Analysis

## Qualitative

Qualitative test for water by the use of the acetylene-cuprous chloride reaction. E. R. Weaver. Am Chem Soc J 36:2462-8 D '14

#### Quantitative

Comparative study of methods for the quantitative determination of sulfur in peptone. H. W. Redfield and C. Huckle. Am Chem Soc J 37:607-11 Mr '15

ibbs medal award; address of acceptance. A. A. Noyes. J Ind & Eng Chem 7:450-1 My Gibbs

Nephelometry (photometric analysis); history of method and development of instruments. P. A. Kober and S. S. Graves. diags J Ind & Eng Chem 7:843-7 O '15

Quantitative determination of fluorine. W: H. Adolph. diag Am Chem Soc J 37:2500-15 N

Quantitative determinations of sulfur in the culture medium for the detection of the bacteria producing hydrogen sulfide. H. W. Redfield and C. Huckle, Am Chem Soc J 37: 612-23 Mr '15

Chemistry, Biological. See Biological chemistry

Chemistry, Inorganic Recent work in inorganic chemistry. Howe. Am Chem Soc J 37:536-49 M Sec also Metals

Chemistry, Medical and pharmaceutical Contributions of the chemist to the manufac-ture of pharmaceutical products. F. R. Eldred, J Ind & Eng Chem 7:939-40 N '15 See also Drugs-Analysis

Chemistry, Organic Electrochemical production of organic com-pounds. Met & Chem Eng 13:211-13 Ap '15 Sce also Acids, Fatty; Alcohols; Aldehydes; Essential oils; Esters; Gas; Hydrocarbons; Ketones; Proteins

Chemistry, chemistry Photographic. See Photographic

Chemistry, Physical and theoretical
Gas manufacture from the point of view of physical chemistry. W. F. Rittman. Am Gas Inst Pro 9:pt 1, 288-300 '14; Same cond. Am Gas Light J 101:395-7 D 21 '14; Same cond. J Ind & Eng Chem 6:1027-30 D '14; Discussion. Am Gas Inst Pro 9:pt 1, 300-4 '14
Salts colored by cathode rays. E. Goldstein. Sci Am S 79:318-19 My 15 '15

Sci Am S 79:318-19 My 15 '15

See also Atomic weights; Atoms; Boiling points; Catalysis; Chemical reaction; Colloids; Crystallography; Dissociation; Electrochemistry; Electrolysis; Electrons; Freezing points; Ions; Isomerism; Liquid air; Melting points; Molecular weights; Optical rotation; Photochemistry; Radioactivity; Solution (chemistry); Stereochemistry; Thermodynamics; Valence; Vapor density

Chemistry, Technical

America as her own chemist; first National exposition of chemical industries. Sci Am 113:302+ O 2 '15

Applied chemistry. L. H. Baekeland. Met &

exposition of chemical industries. Sci Am 13:302+ 0 2 '15
Applied chemistry. L. H. Baekeland. Met & Chem Eng 13:677-81 0 1 '15; Same. J Ind & Eng Chem 7:978-81 N '15; Same. Sci Am S 80:294-5 N 6 '15
Chemical lime. Sci Am S 80:47-8 Jl 17 '15
Contributions of the chemist to American industries: symposium. J Ind & Eng Chem 7:273-304, 931-45 Ap, N '15
Contributions of the chemist to the industrial development of the United States—a record of achievement. B. C. Hesse. J Ind & Eng Chem 7:293-304 Ap '15; Same. Sci Am S 79: 210-11, 234-5 Ap 3-10 '15; Abstract, Wet & Chem Eng 13:287-8 My '15; Abstract, with discussion. Textile World 49:53-5, 74-5+ Ap '15

ontributions of the chemist to various American industries; symposium. Met & Chem Eng 13:283-8 My '15 ermany as nature's competitor. Sci Am 113: Contributions

Germany as n 442 N 20 '15

Industrial uses for liquid air. Eng M 49: 118-21 Ap '15

Problems of chemical industry. R. F. Bacon. J Ind & Eng Chem 7:535-8 Je '15

Research and progress in American manufacture. R. F. Bacon. Sci Am S 80:334-6 N 20 '15 Society of chemical industry annual meeting. Engineer 120:91-2 Jl 23 '15

Substitutes for metals, minerals and their products. Eng M 49:592-3 Jl '15

products. Eng M 49:592-3 Jl '15

See also Acetylene; Alcohol, Denatured; Alkalies; Ammonia; Baking powder; Barium; Brewing; Celluloid; Cement; Chemical engineering; Chemical industries; Coal-tar products; Corrosion and anti-corrosives; Cyanide process; Distillation; Dyes and dyeing; Electrochemistry; Essential oils; Explosives; Fuel; Gas; Gas mantles; Gas manufacture and works; Glucose; Gluc; Gums and resins; Hydrometallurgy; Ink; Metallurgy; Oils and fats; Osmosis; Packing house products; Paint; Paper making and trade; Perfumery; Petroleum; Potash; Precious stones, Artificial; Precious stones, Synthetic; Refractory materials; Rubber; Rubber, Artificial; Soap; Sugar; Sulphuric acid; Tar; Textile industry and fabrics; Waste products; Wood distillation; Wood preservation

Chemists

hemists
Applied chemistry, L. H. Baekeland, Met & Chem Eng 13:677-81 O 1 '15; Same, J Ind & Eng Chem 7:978-81 N '15; Same, Sci Am S 80:294-5 N 6 '15
Coöperation in matters chemical; presidential address, C: H. Herty, Am Chem Soc J 37: 2231-46 O '15

Development of chemical research in America. I. Remsen. Am Chem Soc J 37:1-7 Ja '15 Plea for a chemists' protective association. R. G. Myers. J Ind & Eng Chem 7:798-801 S

Chesapeake & Ohio Northern railroad
New line of the Chesapeake & Ohio Northern.
diags map Ry Age 58:1017-18 My 14 '15
Thirty miles of Chesapeake & Ohio Northern
begun. map Eng Rec 72:300-1 S 4 '15

Chesapeake and Ohio railway
37th annual report. Ry Age 59:591-2, 624-6
O 1 '15

Chess player, Automatic
Torres and his remarkable automatic devices.
il diags Sei Am S 80:296-8 N 6 '15

## Chester, Pennsylvania

#### Bridges

Balanced cantilever reinforced-concrete bridge. H: H. Quimby. il diags Eng N 73:578-81 Mr 25 '15

Chestnut

American chestnut tree. S: B. Detwiler. il map Am For 21:957-60 O '15 Chestnut in the future. Am For 21:967-8 O '15 Commercial uses of chestnut. P. L. Buttrick. il Am For 21:960-7 O '15

Chicago, Illinois

nicago, Illinois
Chicago, the A. R. B. A. convention city. il
Good Roads n s 8:199-203 D 5 '14
Topography of the bed-rock under Chicago.
R. Peattie. maps W Soc E J 19:590-4 Je '14;
Same cond. Eng & Contr 42:605-7 D 30 '14;
Discussion. W Soc E J 19:594-611 Je '14

See also Field museum of natural history

#### Architecture

Chicago's 1914 progress in building, il Bldg Age 37:46-8 F '15

Design and construction of the Chicago Hebrew institute—a reinforced concrete structure possessing unusual features, il plans Eng & Contr 43:558-63 Je 23 '15

#### Bridges

Design, construction and detailed labor costs of the substructure of the double-leaf trunnion bascule bridge at Chicago avenue, Chicago diags plan Eng & Contr 42:388-90, 426-33 O 21, N 4 '14

23 O 21, N 4 '14
Double-deck bascule bridge over Chicago river.
H. E. Young, il diags Eng N 74:876-9 N 4 '15
Substructure for the Jackson street bridge
over the Chicago river, il diags Eng N 73:
550-2 Mr 18 '15

550-2 Mr 18 10 Substructure of the Lake street bascule bridge. H. E. Young, il Eng N 74:934-6 N 11 '15 Two large lift bridges at Chicago, diags Engineer 120:339-40 O 8 '15

#### Harbor

Chicago breakwater extensions, diags Eng N 74:740-1 O 14 '15

### Health department

Report on work of ventilation division of the Chicago health department for 1913. E. V. Hill. diag Am Soc Heat & V E 20:57-73 '14

Ventilating division of the health department, Chicago, Ill. E. V. Hill. Il diags Am Soc Heat & V E 19:412-34 '13

## Hospitals

Chicago municipal tuberculosis sanitarium. C. A. Erikson, il plans Brickb 24:267-72, pl 151-7 N '15

### Hotels

New Morrison hotel plant. T: Wilson, il plans Power 42:70-3, 111-15 Jl 20-27 '15

#### Lighting

Nitrogen-filled lamps in Chicago, il Elec W 65: 1173-4 My 8'15

Street lighting in Chicago. P. E. Haynes. il Illum Eng Soc 10:281-8 no 3 '15; Same cond. Am Gas Light J 102:316-17 My 17 '15 Street lighting in Chicago: report. Elec R & W Elec'n 67:481 S 11 '15

## Municipal pier

Chicago municipal pier il diags Eng N 74: 193-7 Jl 29 '15
Longest municipal pier in United States is nearing completion at Chicago. il diags Eng Rec 71:778-80 Je 19 '15
Severe tests show Chicago municipal pier to be sound in construction. il Eng Rec 72:75
Jl 17 '15

Superstructure of Chicago municipal pier. il Eng N 74:306-8 Ag 12 '15

#### Ordinances, etc.

Chicago flat-slab ordinance; discussion. Eng N 72:1274-7 D 24 '14

## Public works

Central plant will handle repairs to all city equipment. il plan Eng Rec 72:266-7 Ag Chicago's municipal repair shop. C. C. Saner. il Munic Eng 48:289-91 My '15

See also Chicago-Municipal pier

#### Railroads

Alternative plans for rearranging Chicago freight terminals, plans Ry R 56:869-72 Je

reight terminals, plans Ry R 56:503-72 Je 26 '26 '15 Elevated medical methods. H. E. Fisher, il Elec Ry J 45:1192-5; 46:216-19, 430-4 Je 26, Ag 7, S 11 '15 Chicago freight interchange yard, il plans Eng N 73:1153-6 Je 17 '15 Chicago track elevation; Rock Island lines, il diags Eng N 73:670-5 Ap 8 '15 Report of Chicago railway terminal commission. Ry Age 58:1163-4 Je 4 '15; Abstract, Eng N 74:42 J1 1 '15 Rock Island track elevation work at Chicago, il diags Ry Age 58:690-4 Mr 26 '15 Santa Fe to solve Chicago fruit terminal problem, plan Eng Rec 71:819-20 Je 26 '15 Three-level railway crossing at Chicago, il diags plans Eng N 73:708-10 Ap 15 '15 Track elevation on the Nickel Plate railroad at Chicago, il diag map Eng N 74:888-91 N 4 '15 retains in Chicago duving a traction of the chi

Transportation in Chicago during a traction strike, il Ry Age 58:1469-74 Je 25 '15

## Rapid transit

Commission fixes service standards in Chicago. Elec Ry J 46:775 O 9 '15 Safety of trains on the Chicago elevated. il Elec Ry J 46:302-5 Ag 21 '15

## Sanitary affairs

Chicago should no longer depend on sewage dilution. Eng Rec 72:394 S 25 '15
Chicago's sewage and water-supply problem. Eng N 73:1169 Je 17 '15
Future sanitary problem of Chicago; symposium. W Soc E J 19:757-75 O '14
Recommend filtering Chicago water and progressive disposal of sewage. G: A. Soper, J: D. Watson and A. J. Martin. Eng Rec 71: 709 Je 5 '15

See also Chicago-Streets; Chicago-Water supply

## Stock yards

Two years' tests indicate best treatment for Chicago stock yards wastes. il Eng Rec 71: 266-8 F 27 '15

## Streets

Chicago plan and the new heavy-traffic streets. W. D. Moody. map Eng N 73:482-3 Mr 11

Chicago takes a traffic census of the loop. Eng Rec 72:364 S 18 '15 Street cleaning in Chicago. Munic J 38:35 Ja

14 '15 Traffic count on Chicago streets. Elec Ry J 46:632-3 S 25 '15

# Subways (conduits)

Chicago builds its first utility gallery. plan Eng Rec 72:593-4 N 13 '15

Chicago-Subways (conduits)-Continued

Design and construction features of Chicago's first utilities gallery, il diags Eng & Contr 44:376-7 N 10 '15

Pipe subways for the public utilities of Chicago, L; A. Dumond, Eng Rec 70:705-6 D 26

Subways for public-utility pipes and wires in Chicago streets. Eng N 73:60-1 Ja 14 '15

## Water supply

Chicago water works notes, il Munic J 37:918-19 D 24

Chicago's new tunnel and pumping station part of comprehensive waterworks plan. H. S. Baker. map Eng Rec 71:73-4, 103-4 Ja 16-23 '15

Constructing shaft and tunnel at Lake View pumping station, H: W. Clausen. Eng & pumping station, H: Contr 42:500-1 N 25 '14

Wilson avenue water tunnel at Chicago, diags plan Eng N 73:764-7 Ap 22 '15

Chicago & Alton railroad
Abstract of annual report, map Ry Age 59: 795-6 O 29 '15

Chicago & Eastern Illinois railroad Abstract of annual report, map Ry Age 59: 996-7 N 26 '15

Chicago and North Western railway Fifty-sixth annual report. map Ry Age 59:635-6, 672-3 O 8 '15 Valuation work. Eng N 74:843-5 O 28 '15

Chicago, Burlington & Quincy railroad company Sixty-first annual report. map Ry Age 59:944-5, 1033-6 N 26 '15

Chicago central station institute
Training men for the central-station industry.
il Elec W 66:962-4, 1142-4 O 30, N 20 '15

Chicago drainage canal Report on water-power development on the Chicago drainage canal. Eng N 72:1139 D 3

Chicago Great Western railroad Abstract of annual report. map Ry Age 59: 995-6 N 26 '15

Chicago, Lake Shore & South Bend railway Seven years of operating experience of a sin-gle-phase interurban railway, il map Elec Ry J 46:940-5 N 6 '15

Chicago, Milwaukee & St. Paul railway Bridge work of the C., M. & St. P. Ry. il plan Ry R 56:335-8 Mr 13 '15

., M. & St. P. railway high-voltage dir current system. Elec W 64:1186 D 19 '14

Electric traction on the Chicago, Milwaukee & St. Paul Ry. diag map Eng N 73:22-3 Ja 7 '15

Electrification. diags map Engineer 119:104-6 Ja 29 '15

Electrification, C. A. Goodnow, W Soc E J 20: 327-30 Ap '15

Electrification of 440.5 miles of the St. Paul. il map Ry Age 59:683-9 O 15 '15

Electrification of terminal line at Great Falls, Mont. il Ry R 57:57-8 Jl 10 '15

Electrification of the Great Falls terminal, il Elec Ry J 45:1172-3 Je 19 '15

Electrification of the Puget Sound lines. A. H. Armstrong. il diags maps Gen Elec R 18:5-9 Ja '15; Same. Ry Age 57:1125-6 D 18 '14; Same. Elec R & W Elec'n 65:1205-8 D 26 '14; Same. Ry R 56:96-100 Ja 16 '15

Electrification progresses rapidly. Eng N 74: 862 O 28 '15

1500-volt electrification of the Chicago, Milwaukee & St. Paul railway. W. D. Bearce, il Gen Elec R 18:644-5 Jl '15

51st annual report. map Ry Age 59:589-90, 628-30 O 1 '15

Great railway electrification project. il map Sci Am S 79:56-8 Ja 23 '15

ew line from Lewistown, Mont., to Great Falls. il map Ry Age 58:734-9 Ap 2 '15

Operating plans for the electrified division of the C., M. & St. P. il Elec Ry J 44:1341-2 D 19 '14

Progress on the electrification, il Elec R & W Elec'n 67:769-71 O 23 '15; Elec Ry J 46:794-8 O 16 '15; Eng Rec 72:518 O 23 '15; Ry R 57:556-8 O 30 '15; Power 42:645-6 N 9 '15 Transmission system of the electrified divisions, R. E. Wade, il Ry R 57:203-5 Ag 14 '15

Milwaukee & St. Paul roadmasters' association

9th annual meeting, Milwaukee, Wis., Nov. 2-4. Ry Age 59:972 N 19 '15

2-4. Ry Age 59:972 N 19 '15

Chicago, Rock Island & Pacific railroad

Annual meeting of the stockholders, April 12.

Ry Age 58:831-2 Ap 16 '15

Chicago, Rock Island & Pacific—1902 to 1915.

Ry Age 58:774-6 Ap 9 '15

Decrease in earning power of the Chicago,
Rock Island & Pacific, 1902-1914. Ry Age
58:611 Mr 19 '15

Hearing before the Interstate commerce commission, Ry Age 58:1228-9 Je 11 '15

Increase in volume of service rendered by the
Rock Island 1902-1914. Ry Age 58:683 Mr

26 '15

Interstate commerce commission's report Received.

26 '15
Interstate commerce commission's report. Ry
Age 59:323-7 Ag 20 '15
Investigation of the Rock Island system, Ry
R 56:321-2 Mr 6 '15
Receivership, Ry Age 58:890 Ap 23 '15
Rock Island financing, Ry R 57:243-9 Ag 21 '15
Rock Island receivership, Ry R 56:567-8 Ap 24

Rock Island's financing again, Ry Age 58:874-5 Ap 23 '15

Chicago, St. Paul, Minneapolis and Omaha rail-Thirty-fourth annual report. Ry Age 59:637. 674 O 8 '15

Chicory

Manufacture of chicory; a Franco-Belgian industry stopped by the war. J. Boyer, il Sci Am S 80:40-2 Jl 17 '15 Chief interchange car inspectors' and car fore-men's association

17th annual convention, Richmond, Va., Sept. 14-16. Ry Age (Mech ed) 89:522-5 O '15

Chiefs of police, International association of: See International association of chiefs of police

Chiggers

Harvest disease. Sci Am S 80:100 Ag 14 '15

Chihuahua, Mexico

Main mineral zone of the Santa Eulalia district.

B. Prescott. diag map Am Inst Min E Bul
98:155-98 F '15

Child labor Educational scrap heap and the blind alley job. L. W. Dooley. Sci Am S 79:170-1 Mr 13 '15: Excerpts. il Sci Am 112:247 Mr 13 '15 Pennsylvania's new compulsory continuation schools. H. E. Miles. Am Ind 16:28-9 N '15

Children's museums Children's museum. Sci Am 112:250 Mr 13 '15

## Commerce

Mineral exports of Chile. Eng & Min J 100: Trade of Chili in 1914. Am Ind 16:44-5 O '15

# Economic conditions

West coast business, M. R. Lamb, il Eng & Min J 99:433-7 Mr 6 '15

## Finance

Banking and credit in Argentina, Brazil, Chile, and Peru. E: N. Hurley. U S Bur For & Dom Com 90:1-72 '14
Financial developments in South American countries. W: H. Lough. U S Bur For & Dom Com 103:29-34 '15

# Industries and resources

American metallurgist in the Chile nitrate field. Eng & Min J 99:252-3 Ja 30 '15

Braden copper co's. concentrator at Sewell. Eng & Min J 100:894-5 N 27 '15

Chilean nitrate industry. M. R. Lamb. il Eng & Min J 99:811-15 My 8 '15

Early history of Braden mines, Sewell, Chile. W: Braden. il Eng & Min J 100:389-91, 398-9 S 4 '15

Chile—Industries and resources—Continued
Gold and silver in Chile. M. R. Lamb. il Eng
& Min J 99:847-9 My 15 '15
Mining methods at Braden. H. R. Graham.
Eng & Min J 100:831-3 N 20 '15
Potash deposits in Chile. S. Salcedo. Eng &
Min J 100:218 Ag 7 '15
Smalling at Fanulcille, Chile. il Eng & Min
J 100:787-9 N 13 '15
Tofo iron mines in 1914. C. A. Buck. map Eng
& Min J 99:145-6 Ja 16 '15

Chile exploration company, Chuquicamata, Chile High-voltage transmission at high altitude, P. H. Thomas, il diags plan Elec W 65:29-34, 87-92 Ja 2-9 15

Chile saltpeter. See Saltpeter. Chile

Chilled iron

Association of manufacturers of chilled iron wheels; presidential address, G: W. Lyndon. Ry R 57:505-6 O 16 '15; Same cond. Ry Age ed) 89:578 N '15; Excerpts. Elec Ry J 46:918 O 30 '15; Iron Age 96:1059 N 4 '15 Chilled car wheels. W. J. Keep. Foundry 43: 469 N '15

469 N '15
Control of chill in cast iron, considering the elements effective in the manufacture of malleable castings and chilled car wheels. G. M. Thrasher, il Am Inst Min E Bul 106: 2129-38 O '15; Same. Foundry 43:491-3+ D '15; Same. Iron Tr R 57:1171-3+ D 16 '15
Mixture for chilled crusher rolls. W. J. Keep. Foundry 43:187 My '15
Standardization of chilled iron crane wheels; abstracts. F. K. Vial. diags Am Soc M E J 37:147-51 Mr '15; Iron Tr R 55:1083-7+ D 10 '14
Strong claims for chilled iron car wheels. F. K.

Vial. Ry Age 58:520 Ap 16 '15
Wreck due to a faulty car wheel. il Iron Tr R
57:937-40+ N 11 '15

Chilliwack, B. C.

#### Sewerage

Sewage disposal in Chilliwack, D. P. Dunn. diags Munic J 38:687-9 My 20 '15

Chimes

Electrically operated chime outfits, il Elec R & W Elec'n 66:701-2 Ap 10 '15

Chimneys

Boiler ratings and chimney sizes. E: R. Pierce.
Dom Eng 69:301-2 D 5 '14
Brick chimney which floats. il Power 41:740
Je 1 '15

in a cyclone, il Munic Eng 49:82-3

Chimney

Ag '15
Chimney in modern home building. A. Marple. il Bldg Age 37:40-1 F '15
Chimneys for oil- and coal-burning plants. F. H. Rosencrants. Power 41:637-8 My 11 '15
Comparison of chimney sizes. J. C. Lathrop. Power 42:299 Ag 31 '15
Comparison of chimney sizes. L. W. Cutler. Power 42:519-20 O 12 '15
Felling a brick chimney. C: A. Mead. il Eng

Height of chimneys for burning anthracite. Power 42:518 O 12 '15 Proper sizes of chimney flues. Dom Eng 72: 172-3 Ag 7 '15

Razing a brick chimney, il Power 41:374 Mr 16

Razing a 400-ton brick chimney, il diag Eng N 72:1266 D 24 '14
Reinforced concrete as an emergency repair for an iron chimney, il diag Eng & Contr 43: 100-1 F 3 '15
Repairing a badly corroded iron chimney during operation, il Eng N 73:221 F 4 '15

Smelter stacks and lightning, il Eng & Min J 98:1005-6 D 5 '14

Straightening a tall leaning factory chimney by a factory of the f

Tall brick stacks repaired rapidly under diffi-culties, il Eng Rec 72:26 Jl 3 '15

Three points in chimney design. Eng N 74:

Trouble with a leaky chimney, J. R. Bell, diags Bldg Age 37:53-4 Mr '15

Warm-air furnace design and installation. diags Metal Work 84:149-50, 525-6, 575-6 JI 30, O 22, N 5 '15 Wind pulls rivets in stack brace. il Power 42: 426 S 21 '15

See also Fireplaces; Heating; Ventilation

Chimneys, Concrete
Construction of concrete chimneys. P. H. Wilson. il Bldg Age 37:71-2 Ja '15
Design, construction and cost of a 137-ft. reinforced concrete chimney at Coldwater, Mich. K. E. Morton. Eng & Contr 44:111-12 Ag 11

Effects of fumes from lignite coal and from wood on cement brick chimneys. Concrete Cem 5:246-7 D '14

Power plant of Havana gas and electric corporation, il Munic Eng 49:86 Ag '15; Power 41:166 F 2 '15

Reinforced concrete chimneys in Havana, il Concrete Cem 6:281 Je '15

Tearing down a 250-ft, reinforced-concrete chimney at Philadelphia, il Eng N 73:78 Ja 14 '15

Chimneys, Steel

Complicated smokestack connection. diags Eng N 73:443-4 Mr 4 '15; Same. Power 41:643-4 My 11 '15

Cutting down a steel stack, il Power 41:888 Je

Design and construction of a 400-foot steel stack at the United Verde copper co.'s plant, Clarkdale, Ariz, L. W. Barker. il diag Eng & Contr 44:140-1 Ag 25 '15

Difficult smoke-stack job. F. L. Johnson. il Power 42:506-7 O 12 '15 Foundation bolts for steel chimneys. H. D. Hess. diags Power 42:476 O 5 '15; Same. Eng & Min J 100:718-19 O 30 '15

Methods and equipment used in wrecking a 101-ft, steel stack, il Eng & Contr 44:305 O

Reasons for corrosion of steel smokestacks and ways to prevent it. R. I. Elkin. Elec W 66: 1033 N 6 '15

American engineer in China. W: B. Parsons. il map J Fr Inst 179:381-413 Ap '15; Ab-stract. Eng M 49:430-4 Je '15

See also Accounting—China; Forests and forestry—China; Iron mines and mining—China; Railroads—China

### Commerce

China and Indo-China markets for American lumber, F. H. Smith, U.S. Bur For & Dom Com 104:1-39 '15

Winning of the Orient. E: H. Foot. il Am Ind 15:22-3+ Ja '15

Woolen and worsted fabrics in China. mons. Textile World 49:472-5 J1 '1

## Industries and resources

Chinese cotton industry. R. A. Morgan, Tex-tile World 50:187-9 N '15

Chinese machine shop of today. F. A. Foster. Iron Tr R 57:992+ N 18 '15

Cotton manufacturing in China. R. A. Morgan. il Textile World 49:412-13; 50:85-8 Jl, O '15

Mining conditions in China. F. L. Garrison. Eng & Min J 100:26-8 Jl 3 '15

Mining in China. Eng & Min J 100:468 S 18 '15 Opportunity for the engineer in China. F. A. Foster. Am Soc M E J 37:646 N '15

Tariff in China (central station). L. Schmidt-Harms. Elec W 66:138 Jl 17 '15

## Public works

Flood relief in the Huai river district of China. map Engineer 120:331 O 8 '15 Report on flood prevention in China. il Eng Rec 70:679-80 D 19 '14

#### Railroads

Sec Railroads China

China closets

Details of a built-in china case. W. S. Wilkin.

diags Bldg Age 37:27-30 D '15

Chinese wood oil
Constitution of Chinese wood oil varnishes.
E. E. Ware and C. L. Schumann. J Ind &
Eng Chem 7:571-3 Jl '15
Quantitative method for the determination of
the adulteration in Chinese wood oil. J. C.
Brier. J Ind & Eng Chem 7:953-7 N '15

Chloral

Action of chloral, bromal and benzaldehyde on the polycyclic hydrocarbons in the presence of aluminium chloride. G. B. Frankforter and W. Kritchevsky. Am Chem Soc J 37:385-92 W. 15

Chlorides

Chlorides in oil-field waters, C. W. Wash-lume, Am Inst Mm E 13d N7:75 81 Mr 14; Discussion, 90:1374-5; 100:825-30 Je '14, Ap

Chloridizing ores. See Hydrometallurgy

Chlorination process

Chlorination of ores, diag Met & Chem Eng 13:505 Ag '15
Refining gold by Miller's chlorine process; abstract, R. Pearson, Met & Chem Eng 13:508 Ag '15

Chlorine

Chlorine gas on the battlefield. Sci Am 112:452

My 15 '15
Electrolytic cell patents for the production of caustic soda and chlorine, diags Met & Chem Eng 13:815-16 N 1 '15
Electrolytic production of caustic and chlorine, diag Met & Chem Eng 13:506 Ag '15
Ortho-tolidin test for free chlorine, W. F. Monfort, Am Water Works Assn J 1:734-6

D 14

Chlorine, Liquid

Automatic liquid-chlorine water disinfecting plant at Stamford, Conn. J. A. Newlands. il Eng N 73:1158-9 Je 17 '15

ubbly creek filter plant adopts liquid chlor-ine treatment. C. A. Jennings, Am Water Works Assn J 2:401-3 Je '15; Same. Eng N 73:555 Mr 18 '15; Same. Eng Rec 71:338 Mr Bubbly

13 '15 Efficiency of the liquid chlorine sterilization plant at Wakefield, Mass.; abstracts. E; C. Sherman. il Eng & Contr 44:410 N 24 '15; Munic J 39:811 N 25 '15 Liquid chlorine sterilization of the water supply of St. Catharines, Ontario. A. Milne, il plan Eng & Contr 43:188-90 Mr 3 '15 Relative efficiency of liquid chlorine and hypothesis of the contraction of the water supplied to the contraction of the water supplied to the contraction of t

Use of liquid chlorine at Buffalo water-works intake. H. F. Wagner, il plan Eng N 73:856-7 My 6 '15
Water berne typhoid in Sacramento, Cal. interesting application of liquid chlorine, N. E. Williamson, Eng & Contr 44:314 O 20

Chloroacetates

nioroacetates
Salts of the chloroacetic acids, W. G. Bateman and A. B. Hoel, Am Chem Sec. J. 36;
2517-21 D '14
Salts of the halogenoacetic acids, W. G. Bateman and D. B. Conrad, Am Chem Soc. J. 37;
2553-60 N '15

Chlorobenzoylacetic esters
o-and p-chlorobenzoylacetic esters and some
of their derivatives. L. Thorp and E. R.
Brunskill. Am Chem Soc J 37:1258-64 My '15

Chlorophyll Method of investigation, R: Willstätter, Am Chem See J 37:323-45 F '15

Chloropicrin

Production of chloropierin by the action of agua regia on organic centre 1916. R. L. Datta and N. R. Chatterjee, A., Chem Soc J 37:567-9 Mr '15

Christmas printing
Essentials to holiday printing. J. L. Frazier.
Inland Ptr 54:369-71 D '14

Examples of holiday printing. il Inland Ptr 54: 368a-368h; 56:352a-352h D '14, D '15

Reproduction of designs of Christmas greetings. J. L. Frazier. Inland Ptr 54:657-60 F '15

Christmas trees, Municipal Municipal Christmas tree for Dayton, il Elec R & W Elec'n 66:71 Ja 9 '15

Christy, Samuel Benedict, 1853-1914 Sketch, R. W. Raymond, por Eng & Min J 98,1161-61 p. 19-11; Same, Am Inst Min E Bul 100:705-9 Ap '15

Chromium

omium ffect of chromium and tungsten upon the hardening and tempering of high speed tool steel: abstract with discussion, C. A. Edwards and H. Kikkawa. Iron Age 96:1126-7 N 11

See also Nickel chromium

Chromophotography. See Color photography

Chronophotography

Electric lighting for motion-picture studios. L. G. H. Smith. Elec W 65:1040-2 Ap 24 '15 See also Moving pictures

Chucks

Air-operated chucks and mandrels. E. F. Lake. il diags Mach 21:476-9 F '15 Bicknell-Thomas tapping chuck. il Mach 22:

Boring and facing back end main rod brasses

Borning and tacing back end main rod brasses and driving boxes. M. Flanagan. il diags Ry Age (Mech ed) 89:239-40 My '15 Chuck for finishing air pump packing rings. F. R. Stewart. diags Ry Age (Mech ed) 89: 589 N '15

F. R. Stewart, diags Ry Age (Mech ed) 89: 589 N '15
Chuck for finishing boiler check bodies. W. W. Elfe, il Ry Age (Mech ed) 89:133 Mr '15
Chucking ring and jaw extension for turning pistons. H; Doren, diag Mach 21:1010 Ag '15
Eclipse roller bearing drill chuck, il diag Mach 21:428-9 Ja '15
Horton combination geared scroll chucks. il diag Mach 21:329 D '14; Iron Age 94:1279 D 3 '14

Improved Wahlstrom drill chucks, diags Mach

Improved Wahlstrom drill chucks, diags Mach 22:151 O '15
Kipnis automatic drill and lathe chucks, il diags Mach 21:514-15 F '15
Preventing lathe chucks from sticking, diag Mach 21:748-9 My '15
Shoe and wedge chuck for milling machine table, R. E. Brown, diags Ry Age (Mech ed) 89:591 N '15
Special chucks for air nump repairs, W. W. Special chucks for air pump repairs, W. W. Elfe, il Ry Age (Mer. ed.) 20183 Ap 15

Wrenchless chucks, il Metal Ind n s 13:474 N

Chucks, Magnetic
Blanchard magnetic chuck, il diags Mach 21:
678-9 Ap '15

Electrical appliances for workshops, il Engineer 119:570-2 Je 11 '15 Holding work on the magnetic chuck for milling, il Mach 22:50 S '15

Church architecture

hurch architecture
Books on colonial architecture, R: F. Bach,
bibliog Arch Rec 38:379-82 S '15
Church of Ablain St. Nazaire, J. P. Alaux, il
Am Inst Arch J 3:337-8 Ag '15
Church towers, steeples, and spires of Sir
Christopher Wren, R. R. Phillips, il Brickb
24:185-9, 228-32 Ag-S '15
Competition for a small brick church and parish house, il Brickb 24:148-52 Je '15
Emile Vaudremer, J. P. Alaux; L. Brachet;
W. Cook, il plans Am Inst Arch J 3:292-9 Jl
'15

'15
First church of Christ, Scientist, Los Angeles, Cal. il diags plans Brickb 24:pl 86-8 Je '15
First church of Christ, Scientist, Los Angeles; design and plan, Arch & Bldg 46:478a D '14
First church of Christ, Scientist, Worcester, Mass, il plans Brickb 24:pl 89-90 Je '15
Frame church building at Longar, Ill. il diags plans Bldg Age 37:31-4 Jl '15
House of Hope Presbyterian church, St. Paul, Minn, il plan Arch Rec 37:410-24 My '15
Modern brick-yeneer frame church erected under three contracts, il diags plan Bldg Age

Jouern brick-veneer frame church erected under three contracts, il diags plan Bldg Age 37:29-32 Mr '15
Notable church edifice: the Val de Grace, in Paris, erected in 1638, il Bldg Age 37:62-4
My '15

Ny 15
Rayenswood Presbyterian dhurch, Sair views and plans. Brickb 24:pl 117-18 Ag '15
Sheet metal for St. Ignatius church, San Francisco. W. A. Douglas. il Metal Work 83:162-3+ Ja 22 '15
Thoughts on reading J. C: Cox's The English Parish church. Am Inst Arch J 3:339-43 Ag

Church architecture—Continued
Trinity Lutheran church, Akron, Ohio. I. T.
Frary, il plans Arch Rec 37:252-67 Mr '15
Village church in England, J; Y, Dunlop, il
Bldg Age 37:37-41 D '15
Webb Horton Memorial Presbyterian church,
Middletown, N. Y, Brickb 24:pl 1-3 Ja '15

See also Abbeys; Chapels

Church finance

Church and business methods. J Account 19: 294-6 Ap '15

Church lighting

Church lighting. F. L. Godinez, il plan Arch & Bldg 47:221-5 Je '15 Lighting of a church in war time. il Illum Engr 8:478 N '15

Churches

See also Church architecture; Church lighting

Heating and ventilation

Church warmed by cast-iron sectional boiler, il plans Metal Work 83:98-100 Ja 8 '15
Features of economical church heating plant, il plans Metal Work 83:405-8 Mr 19 '15
Ventilating and cooling a church, plan Bldg Age 37:61-2 S '15
Ventilating and cooling church edifice, plan Metal Work 82:757-8 D 11 '14

Churn drills. See Rock drills

Chutes

Minimum slope for concrete chutes. W. H. Insley. Eng & Contr 44:400 N 17 '15

Apple syrup and concentrated cider. Sci Am S 80:78-9 Jl 31 '15

Cinchona alkaloids

Nature of the catalysis in the conversion of
the cinchona alkaloids into their toxines.

H. C. Biddle. Am Chem Soc J 37:2088-2112 H. C S 15

Cinchotoxine

Rate of conversion of cinchonidine into cinchotoxine, H. C. Biddle and R. H. Butzbach. Am Chem Soc J 37:2082-7 S '15
Rate of conversion of cinchonine into cinchotoxine, H. C. Biddle and O. L. Brauer. Am Chem Soc J 37:2065-82 S '15

Cincinnati, Ohio

Bridges

Construction features of the reinforced concrete cantilever bridge on Runnymede avenue. il Eng & Contr 43:312-13 Ap 7 '15

Design of the reinforced concrete cantilever bridge on Runnymede avenue, diags Eng & Contr 43:271-2 Mr 24 '15

Hopple street viaduct, Cincinnati. il diags Munic J 39:179-83 Ag 5 '15

Fire department

Cincinnati's fire department, il Munic J 39:283-7 Ag 26 '15

Hospitals

New General hospital. J. R. Schmidt. il plan Arch Rec 37:453-63 My '15

Lighting

Cincinnati franchise negotiations. Elec W 66: 105 Jl 10 '15

Rapid transit

Rapid transit plans for Cincinnati. Elec Ry J 45:108 Ja 9 '15

Sewerage

Design of regulators and storm water overflows for sewers. E. J. Miner. diags Eng & Contr 42:156-7 Ag 12 '14

Method and cost of making a relocation survey of underground pipe lines. O. E. Carr. plans Eng & Contr 42:153-5 Ag 12 '14; Same cond. (Underground survey of Cincinnati). Eng Rec 71:38-40 Ja 9 '15

Streets

Cincinnati street cleaning. Munic J 38:38-9 Ja 14 '15

Sidewalk work in Cincinnati. D. L. Barr. Munic J 38:763-6 Je 3 '15

Water supply

Brass screen between sand and gravel eliminated in Cincinnati filter reconstruction. J. W. Ellms. il Eng Rec 71:581-2 My 8 '15 Cincinnati builds high-pressure fire service system. J. A. Hiller, il diags Eng Rec 71:590 My 8 '15 My 8

My 8 '15 Cincinnati plant has eliminated waterborne typhoid. Eng Rec 72:336 S 11 '15 Cincinnati water works. J: W. Hill. diag Am Water Works Assn J 2:42-60 Mr '15 Design details of the Cincinnati high pressure fire system. diags Eng & Contr 43:529-32 Je 16 '15

16 '15
Failure of 60-in. water main at Cincinnati by longitudinal compression. J: W. Alvord. diags plan Eng & Contr 43:148-50 F 17 '15; Same cond. Eng Rec '71:588-9 My 8 '15; Excerpt. Eng N 73:407-8 F 25 '15
Operations of the Cincinnati water-filtration plant for 1914. J. W. Ellms. il Eng N 73:854-6 My 6 '15

Cinder concrete, See Concrete, Cinder

Cinders

Ginder crushing and pulverizing mill. il Iron
Age 96:242 Jl 29 '15.
Cinder removal from flue gases. C. B. Grady.
diag Eng M 48:905-7 Mr '15
Performance of a cinder catcher. M. Van Valkenburgh and M. H. Isenberg. plan Power
40:918-19 D 29 '14

Cinematograph Current supply for motion picture machines. H. R. Johnson, il diags Gen Elec R 18:895-904 S '15

Motion-picture camera of radical design, il Sci Am 113:276 S 25 '15

See also Moving pictures

Cinnabar. See Mercury

Cinnamic aldehyde
Researches on hydantoins; the condensation
of cinnamic aldehyde with hydantoins. T. B.
Johnson and R: Wrenshall. Am Chem Soc J
37:2133-44 S '15

Ciphers

codes. H. A. Darnell. Sci Am 113:181 Cipher Ag 28 '15

Cipher codes and their uses. E. C. Edwards. Sci Am 113:9 Jl 3 '15

Cipher codes simplified, I. J. Paddock, Sci Am 113:271 S 25 '15

Enciphering and deciphering codes. F. Moorman. Sci Am 113;159 Ag 21 '15

Science of the cipher and an explanation of Bacon's undecipherable system, W: W. Brewton. Sci Am S 79:394-5 Je 19 '15

Simple cipher code. H. S. Woodworth. Sci Am 113:291 O 2 '15

Circle building. See New York (city)-Archi-

Circles

Elementary perspective drawing. (tredge. Bldg Age 37:24-6 Ag '15 G: W. Kit-

Table for spacing off circles. A. McAlpine. Foundry 43:280a Jl '15

Circuit breakers, Electric. See Electric circuit breakers

Circular letters. See Sales letters

Cisterns

Filter and rain-water cistern, diags Bldg Age 37:37-8 Ap '15; Same, Metal Work 84:485+ O

New type of adjustable cistern form. Concrete Cem 6:107-8 F '15

Cities

See also City planning; Cleaning of cities; Garden cities; Model towns; Municipal gov-ernment and other headings beginning Mu-nicipal; Parks; Street cleaning; Streets

Citrus oils Determination of volatile esters in citrus oils and extracts. A. R. Albright and C: O. Young. Am Chem Soc J 37:2382-7 O '15

City forester. See Trees

City government. See Municipal government City manager plan. See Municipal government— City manager plan

City managers

Training and advancement of city managers, K. Riddle. Eng N 73:822-3 Ap 29 '15 Training for city managers. H: M. Waite. Eng Rec 70:671-2 D 19 '14

See also Municipal government-City manager plan

City managers' association
First convention of city managers, Eng N 72:
1189-90 D 10 '14

First convention, Springfield, O., Dec. 2, 3 and 4, 1914. Munic J 37:903 D 17 '14
First meeting, Dec. 2-4, at Springfield, Ohio.
Eng Rec 70:sup 286 D 12 '14
2d annual convention, Dayton, O., Nov. 15-17.
Munic J 39:823-4 N 25 '15

City planning
Alley problem. C: B. Ball. Eng N 74:871 N 4

Alley problem, C; B. Ball, Eng N 74:871 N 4
15
Architect's part in the world's work, F; L.
Ackerman, Arch Rec 37:149-58 F '15
Aspects of city-planning administration in
Europe, F, B, Williams, Am Inst Arch J
3:260-4 Je '15
Battle with chaos; the architectural side of
city planning, F, L. Ackerman, Am Inst
Arch J 3:444-7 O '15
Building-area, height and other limitations to
use of private city property compiled, N. P.
Lewis, Eng Rec 72:597-8 N 13 '15
Burnham as a pioneer in city planning, W; E,
Parsons, il plans Arch Rec 38:13-31 Jl '15
City plan for Detroit, E, H, Bennett, plans
Am Inst Arch J 3:264-8 Je '15
City planning and civic-center work in Denver,
H; Read, il Am Inst Arch J 3:497-500 N '15
City planning—how it should be prosecuted,
N. P, Lewis, Eng Rec 72:415-17 O 2 '15
City planning in Queens borough, New York,
F, B, Tucker, map Eng N 74:638-41, 689-91
S 30-O 7 '15
City planning—what it is—four main features,
N. P, Lewis, Eng Rec 72:282-4 S 25' '15

S 30-0 7 '15
City planning—what if is—four main features.
N. P. Lewis. Eng Rec 72:382-4 S 25 '15
Commonsense and continuity of policy in town planning. R. C. Sturgis. Am Inst Arch J 3:307-8 Jl '15
Comprehensive city planning in Philadelphia.
B. A. Haldeman, il Am Inst Arch J 3:255-60
Je '15
Comprehensive plan report for Philagenout Comp

B. A. Haldeman. II Am Inst Arch J 3;250-60 Je '15
Concise city plan report for Bridgeport, Conn. Munic J 38:475 Ap 8 '15
Constitution and powers of a city-planning authority. R. H. Whitten. Am Inst Arch J 3;251-5 Je '15
Coöperation of the real-estate developer and town-planner in land subdivision. P. A. Harsch. Am Inst Arch J 3;308-10 Ji '15
Dominion town planning. T: Adams. Eng N 73:573-4 Mr 25 '15
Dunderhead in town planning. W. R. B. Willcox. Am Inst Arch J 3;172-4 Ap '15
Economic side of city planning. H: Wright. maps Assn Eng Soc J 54:79-93 F '15
Ellen Wilson memorial homes to be erected at Washington, D. C. G: B. Ford, il plans Am Inst Arch J 3:352-7 Ag '15
How apportion costs of municipal improvements? N. P. Lewis. Eng Rec 72:666-7 N 27 '15

How to go about city planning, W. D. Moody, il Am Inst Arch J 3:393-8 S '15 Ideals in city planning, H. Emerson, Sci Am S 78:379-80 D 12 '14 McKim and the park commission, G. Brown, il plan Arch Rec 38:681-9 D '15 Modern city planning and maintenance, by F. Koester, Review, Am Inst Arch J 3:83-5 F

Municipal control of street planning; abstracts of laws of cities, states, and Canadian provinces. A. L. Bostwick. Munic J 39:145-7 Jl 29'15

National conference on city planning. Eng N 73:1190 Je 17 '15

Need of a city plan and of a city topographic map. J. W. Shirley. Eng N 73:281-2 F 11 '15; Same. Munic Eng 48:58-61 Ja '15

ew York tax list: fluctuation of real estate values due to lack of regulation of the char-acter of buildings. Am Inst Arch J 2:572-3 D New

Progress of city planning in St. Louis. plans Am Inst Arch J 3:271 Je '15

Reasons for city topographic surveys. H. C. Mitchell. Eng N 73:280-1 F 11 '15

Reconstructed city. J. R. Smith. Eng & Contr

Reconstructed CHA, J. R. Shitta, Eng & Cond., 44:62-4 Jl 28 '15'. Re-planning in Detroit: report to the Board of street railway commissions by Barclay, Parsons and Klapp, il Am Inst Arch J 3:268-

70 Je '15
Scheme to relieve congestion at busy street intersection, il Eng N 71:875 N 4 '15
Significance of the English town-planning act of 1909. F. B. Williams, il diags Am Inst Arch J 3:216-21 My '15
Six years of city planning in the United States. F. Shurtleff, Am Inst Arch J 3:249-51

Je '15
Street mapping. L: L. Tribus. Good Roads n s
10:235 O 23 '15
Tradition and city development. H. V. Lanchester. Am Inst Arch J 3:121-5 Mr '15
See also Building laws; Garden cities; Housing problem; Model towns; Municipal im-

## Bibliography

Bibliography of town planning, Am Inst Arch J 3:272-3 Je '15

Study and teaching

City-planning instruction in the public schools of Newark, New Jersey, J. C. Dana, Am Inst Arch J 3:447-8 O '15

City surveying. See Surveying; Topographical surveying

Civil engineering

Review of the year 1914. Sci Am 112:6 Ja 2 '15 Seventy years of civil engineering. il Sci Am 112:527-9+ Je 5 '15 What the Panama-Pacific exposition means to civil engineering and contracting. Eng Rec 71:619-20 My 15 '15

See also Aqueducts; Arches; Architecture; Blasting; Breakwaters; Bridges; Building; Canals; Cofferdams; Curves; Dams; Docks; Drainage; Dredging; Drilling and boring (earth and rocks); Earthwork; Embankments: Engineering; Excavation; Flood control; Foundations; Grading; Harbors; Highway engineering; Hydraulic engineering; Irrigation; Mining engineering; Municipal engineering; Piles and pile driving; Public works; Railroad engineering; Railroads—Construction; Reclamation of land; Rivers; Roads; Sanitary engineering; Shore protection; Steel construction; Strains and stresses; Streets; Subways; Surveying; Tunnels and tunneling; Walls; Water supply engineering

### Examinations

California examination for construction engineer. Eng N 74:1081 D 2 '15

Civil engineers

British engineers advised as to uniform charges. Eng Rec 72:80 Jl 17 '15 Compensation of civil engineers. Eng N 73:34-7 Ja 7 '15

Compensation of engineers. Ry R 56:82 Ja 16

Compensation of engineers varies widely—those in contracting fare best. Eng Rec 71: 139-42 Ja 30 '15

More light on the compensation of engineers. Eng Rec 71:129 Ja 30 '15

National factory of safety, giving engineers instruction in military matters. W: R. King. Eng Rec 71:133 Ja 30 '15 See also Engineers

Civil engineers, American society of. See American society of civil engineers

Civil service

Federal law protecting government employees. R: D. Micou. Eng N 73:665 Ap 8 15

# Examinations

Choosing a first-class water works superintendent in Massachusetts. Eng & Contr 44: 292-3 O 13 '15

Engineers and civil-service examinations in Philadelphia and elsewhere. A. M. Swanson. Eng N 73:277-9 F 11 '15

Civil service-Examinations-Continued

Questions asked in examination of applicants for position of water works superintendent at Kalamazoo, Mich. Eng & Contr 44:158-9 S 1 '15

Clamping devices. See Machine tools-Fixtures

Adjustable foundry clamp, il Foundry 43:169

Ap '15
Clevis clamps for stranded conductors, il Elec Ry J 45:805-6 Ap 24 '15
Handy flask clamp, J. F. Buchanan, il diag Foundry 43:242-3 Je '15
New cast-steel clamp for guard-rails, diag Eng N 72:1161 D 10 '14
Overhead straight line and angle protective crossing clamps, diags Elec Ry J 46:598-9 S 18 '15; Elec W 66:770 O 2 '15
Pneumatic plate flanging clamp, il Iron Tr R 56:271 F 4 '15

Class rooms

Modern schoolhouse: the class room, W. H. Kilham, plans Brickb 24:3-8 Ja '15

Classification

lassification
Filing of technical literature. W: Arthur. Elec Ry J 45:511-12 Mr 13 '15
Indexing and filing technical literature. A. R. Kenner. Eng & Min J 99:851-6 My 15 '15
Proposed system of classifying and digesting the records of the society; with discussion. E. J. Prindle. Am Soc M E J 37:272-6 My '15
Random reflections on classification of men and sciences. Sci Am 112:127 F 6 '15

See also Joint committee on classification of technical literature

Classification, Decimal
Indexing of electrical engineering subjects.
Elec W 65:1026-7, 1229 Ap 24, My 15 '15
Subject index system of classification for filing
data and plates. Am Inst Arch J 3:43-5 Ja:'15
Suggested extension of the Dewey decimal
system of classification to gas engineering.
D. S. Knauss. Am Gas Inst Pro 9:pt 2, 174650; Discussion. 9:pt 2, 1750-7 '14
Classification. of electromagnetic machinery.

Classification of electromagnetic machinery. F. Creedy, diags Am Inst E E Pro 34:1399-1423 Jl '15

Classifiers

Use of hydrometallurgical apparatus in chemical engineering. J: V. N. Dorr. il diags Met & Chem Eng 13:55-9 Ja '15; Same. J Ind & Eng Chem 7:119-22 F '15

Clay

lay
Atterberg plasticity method, C: S. Kinnison.
U S Bur Stand Tech Pa 46:1-18 '15
Burnt clay as concrete aggregate. il Eng &
Contr 43:453 My 19 '15
Lateral pressure and resistance of clay, and
the supporting power of clay foundations.
A. L. Bell. Engineer 119:124 Ja 29 '15
Mineralogical constituents of clays. W: H.
Fry. Econ Geol 10:292-5 Ap '15
Plasticity of clay and its relation to mode of
origin. N. B. Davis. il Am Inst Min E Bul 98:
301-30 F '15
Use of sodium salts in the purification of

se of sodium salts in the purification of clays and in the casting process. A. V. Bleininger, il diags U S Bur Stand Tech Pa 51:1-40 '15

White-burning clays of the southern Appala-chian states. J. H. Watkins. il map Am Inst Min E Bul 98:391-411 F '15; Abstract. Met & Chem Eng 13:179-80 Mr '15

See also Bricks

Clay products
Legal interpretation of the word "vitrified"
as applied to ceramic products. E: Orton, jr.
Eng Rec 72:74 Jl 17 '15; Eng N 74:171 Jl 22

See also Bricks; Pottery; Tiles

Clayton act

Clayton act—and other things. W: H. Taft. Am Ind 15:34-7 Je '15 Clayton act and the exclusive agent. E. J. Buckley. Metal Work 82:835 D 25 '14

Exclusive agencies and the Clayton act. Elec R & W Elec'n 66:527-9 Mr 20 '15

Federal trade commission and the Clayton law. R. C. Butler and C. Lynde. Ry R 56:442-3 Mr 27 '15

Important decision on the Clayton act. Sci Am 113:163-4 Ag 21 '15
Legality of exclusive agencies upheld. Elec R & W Elec'n 66:908 My 15 '15
Supreme court and the Clayton bill. Am Ind 15:29-30 Ap '15

Cleaning machined parts. il Iron Age 96:627 S

Cleaning machined parts. It from Age 96:527 S
16 '15
Dry cleaning at home. Sci Am 113:441 N 20 '15
Industrial uses of hydrofluoric acid. K. F.
Stahl. J Ind & Eng Chem 7:56-8 Ja '15;
Same. Sci Am S 79:140-1 F 27 '15
Traveling mill for cleaning scrap. il plan Iron
Age 96:14-15 Jl 1 '15

See also Bleaching; Boiler cleaning; Car cleaning; Laundry; Street cleaning; Vacuum cleaning

Cleaning of cities

Annual municipal clean-up week in Philadelphia, il Eng N 73:620-1 Ap 1 '15

Comprehensive clean-up campaign for Cincinnati. Munic Eng 48:303-4 My '15

Three roofs furnish more dirt than 414 miles of street, il Eng Rec 71:683 My 29 '15

Cleaning of water mains. See Water pipes-Cleaning

Cleanliness

See also Disinfection and disinfectants; Sanitation

Clearing of land

Costly highway clearing in dense forests. il Eng Rec 71:21 Ja 2 '15 Portable stump boring machine. il Sci Am 112:

Steam land-clearing machine, il Eng & Contr 42:166 Ag 12 '14

See also Lumbering

Cleburne, Texas

Sewerage

Design feature of new sewerage system and sewage disposal works. R. E. McDonnell. diags plans Eng & Contr 44:72-5 Jl 28 '15

Cleveland, Ohio Cleveland and its industries. S: Mather. Iron Tr R 57:852+ O 28 '15

Bridges

Details of main span of Detroit-Superior bridge at Cleveland, diags Eng Rec 70:640-1 D 12 '14

D 12 '14
Fast concreting on Brooklyn-Brighton viaduct, il diags Eng N 74:481-6 S 9 '15
Methods and equipment used in constructing the superstructure of the Detroit-Superior high level bridge, il diags Eng & Contr 44: 10-13 Jl 7 '15

Division of purchases and supplies

Purchasing and distributing supplies in Cleveland, A. R. Callow, il Munic J 39:391-4 S 9

Lighting

Cleveland's muncipal electric light plant, il diags Munic J 38:869-75 Je 24 '15 Design and operation of the Cleveland munici-pal electric light plant: abstracts with dis-cussion. F: W. Ballard. il diags Am Soc M E J 37:104-11 F '15; Power 41:104-8 Ja 19 '15; Abstract of discussion. Elec W 64:1139-40 D

Engineering features of Cleveland public lighting plant. il Elec W 65:1619-22 Je 19 '15

Ordinances, etc.

Heating ordinance of Cleveland. V. D. Allen, Dom Eng 70:44-6, 72-4, 155-6 Ja 9-16, 30 '15 How Cleveland fixes sizes of courts and yards, plan Eng Rec 71:614 My 15 '15

Railroads

Railway terminal projects in Cleveland. Ry R 57:153 Jl 31 '15

Stores

Ames store, il plans Arch & Bldg 47:359-64 O

Streets

Street repair in Cleveland, Ohio; with cost tables. P. J. Masterson and others, il Munic Eng 49:174-8 N '15

Cleveland, Ohio - Continued

Water supply

Cleveland west side water-supply tunnel. il diags plan Eng N 73:4-8 Ja 7 '15

Ninth street pier in Lake Erie at Cleveland, Ohio. il diags Eng N 74:258-60 Ag 5 '15 Cleveland, Cincinnati, Chicago & St. Louis rail-

Annual report. Ry Age 58:769-70 Ap 2 '15

Cleveland engineering society \*
Engineer and publicity, with special reference
to the publicity work of the Cleveland engineering society; abstract. C. E. Drayer. Eng
& Contr 42:574-5 D 23 '14; Abstract, with
discussion. Am Soc M E J 37:88-92 F '15

Climate

Effect of climate on location of manufacturing plants. W: M. Booth, Sci Am S 79:219 Ap 3

Power 42:302-4 Ag 31 '15
Clinkering of coal, L. S. Marks. diags Am Soc
M E J 37:205-8 Ap '15; Same. Power 40:9324 D 29 '14; Discussion. Am Soc M E J 37:
208-14 Ap '15
Clinkering of

Clinkering of coal. O. W. Palmenberg. Colliery

35:291 Ja '15 Formation of clinker in coal. S. U. Tuspin. Elec W 65:1184-5 My 8 '15

Sec also Cement clinker

Measurements for the household, il U S Bur Stand Circ 55:126-35 '15

Closed shops. See Open and closed shops

Cloth-sample books

Outgrowths of letterpress: the cloth-sample book industry. G: Sherman. Inland Ptr 54: 625-30 F '15

Cloth testing. See Textile industry and fabrics-Cloth testing

Cloth windows

Hygienic home: facts about ventilation and fresh air. J: B. Todd. Sci Am S 79:74 Ja

Clothing a winter army. Sci Am 112:215+ Mr

iery; Textile industry and fabrics; Underwear See also Cloth-sample books; Coats; Hos-

Clothing trade British India. U S Sp Cons Rep 72:259-65 '15 Club rooms

Rooms of the Bankers' club of America, il Arch & Bldg 47:184-7 My '15 Clubhouses Addition

ddition to the New York Harvard club. J: T. Boyd, jr. il diags Arch Rec 38:615-30 D '15

Boston city club, Somerset street, Boston, Mass.; views and plans. Brickb 24:77, pl 31-6 Mr '15

Church club house, St. Paul, Minn. il plans Brickb 24:169-70 Jl '15

Country-club houses, H. D. 1 Arch Rec 38:206-27 Ag '15 Eberlein, il plans

Elks' club house, Brooklyn, N. Y.; views and plans. Brickb 24:77, pl 37-9 Mr '15

Modern equipment in Detroit athletic club. il diag plan Metal Work 84:37-9+, 73-6 Jl 9-16 '15

Musicians' mutual relief society building, Boston. il plans Brickb 24:125-6 My '15

New building for the T-square club, Philadel-phia, Pa. J: F. Harbeson, il plans Brickb 24:253-4 O '15

Plumbing work in Harvard club of New York. il plan Metal Work 84:605-7 N 12 '15

Three Arts club, Chicago; views and plans. Brickb 24:pl 112-14 Ag '15 Yale club's new house. M. Wilcox. il plans Arch Rec 38:310-42 S '15

See also Club rooms

Clutches

lutches
Allowable friction values; effect of the speed
of rotation on the operation of a friction
clutch. B. D. Pinkney. Mach 21:793-4 Je '15
Combined friction and positive clutch. il Iron
Age 95:239 Ja 28 '15
Design of friction clutches of the split-ring
type. W: J. Walker. diag Engineer 118:610-11

Dodge safety self-oiling clutch, il Textile World 48:631-2 Mr '15; Power 41:801 Je 15 '15 Friction clutch for power hammers, diag Iron Age 95:1069 My 13 '15

Hilliard friction clutch. il diag Mach 21:509 F

Hilliard rack-and-pinion clutch shifter. il Power 41:706 My 25'15

Ideal multi-cone clutch. diag Power 41:533 Ap 20 '15

Sheet working machinery clutch. il Iron Age 95:183 Ja 21 '15

Clyde river

Improvement of the river Clyde and harbour of Glasgow, 1873-1914. T: Mason. Engineer 119:277 Mr 19 '15

Coal

oal

Absorption of oxygen by coal. W. F. Winmill.
Colliery 36:147-52 O '15

Anthracite and bituminous production, 1914.
Colliery 35:381 F '15

Chart for coal purchasers. W. V. Bowles.
Power 41:200 F 9 '15

Clinkering of coal. L. S. Marks. diags Am
Soc M E J 37:205-8 Ap '15; Same. Power 40:
932-4 D 29 '14; Discussion. Am Soc M E J
37:208-14 Ap '15

Coal and its economical use. P. S. Thompson.
Inst E E J 53:184-7 Ja 15 '15; Abstract.
Elec W 65:422-3 F 13 '15; Discussion. Inst
E E J 53:187-90 Ja 15 '15

Coal shortage in Europe. W. S. Hiatt. Ry Age
59:476 S 10 '15

Coals ordage in Europe. W. S. Hiatt. Ry Age
59:476 S 10 '15

Coals and coal fields of the Rocky mountain
region. R: C. Hills. Colliery 36:137-41 O '15

Coking of coal at low temperatures with special reference to the properties and composition of the products. S. W. Parr and
H. L. Olin. il Ill U Eng Exp Sta Bul '79:1-39
'15; Same cond. Iron 'Tr R 57:1027-34 N 25
'15

'15
Composition and qualities of coal, E: C. Jeffrey, il Econ Geol 9:730-42 D '14
Cost factors in coal production, W: H. Grady, diags Am Inst Min E Bul 101:1035-64; Discussion, 101:1064-72; 103:1469-70 My, JI '15
Finding the best coal, C. W. Hubbard, Power 41:206 F 9 '15
Costil regins in coal, Collienty 25:521 2 My, '15

41:206 F 9 '15
Fossil resins in coal. Colliery 35:521-2 My '15
Fossils of aid to the coal prospector. Colliery
35:499-500 Ap '15
Future methods of utilizing coal. C. F. Hirshfeld. Power 41:488-9 Ap 6 '15; Same. Sci Am
S 80:58-9 Jl 24 '15
Iron a factor in the world's progress. J: Birkinbine. J Fr Inst 179:476-9 Ap '15; Excerpt.
Sci Am S 80:326 N 20 '15
Winds of coal produced in the United States

Sci Am S 80:326 N 20 '15 Kinds of coal produced in the United States. Sci Am S 80:32 Jl 10 '15 New knowledge of coal. Eng Rec 71:159 F 6 '15 New knowledge of coal and its practical application. H. C. Porter. J Ind & Eng Chem 7: 239-42 Mr '15

239-42 Mr '15
Oklahoma smokeless coals. E: F. Hackett.
map Colliery 35:593-5 Je '15
Origin, occurrence, and behavior, of the gases
usually found in mines. F. Haas. Colliery
35:375-9 F '15; Discussion. 35:436-41, 483-5,
501-2 Mr-Ap '15
Production of coal in the eight principal coalmining countries in the world, from 1870 to
1913. J: Birkinbine. J Fr Inst 179:487-8 Ap
'15

Purchase of coal. M. B. Smith. Power 41:235-6

F 16 '15
Purchasing coal on heat unit basis. Sci Am S 79:403 Je 26 '15
Rank of coal-producing states. Sci Am S 80: 119 Ag 21 '15
Scheme for weighing coal during stoker trials. diag Elec W 66:695 S 25 '15
Simplified method of determining cost of coal per 1000 lb. of steam; chart. W. H. Schott. Elec W 66:754-6 O 2 '15; Same. Power 42: 456-8 S 28 '15; Same. Eng & Min J 100:636-8 O 16 '15

Coal -Continued

oal—Continued
Sulphur in coal. Elec W 65:350-1 F 6 '15
Unit coal. Sci Am S 79:397 Je 19 '15
Use of coal and production of cheap power.
W. F. Reid. Power 42:318 Ag 31 '15
Use of thickness contours in the valuation of lenticular coal beds. G. S. Rogers and C. E. Lesher. maps Econ Geol 9:707-29 D '14
Variation in coal constituents for similar B.t.u. values. H: D. Jackson. Power 41:441 Mr 30 '15

Waste in the selection and purchase of coal. G. B. Gould. Eng M 49:850-61-S '15
Why do you wet coal on the forge? L. K. Hirshberg. Colliery 35:414 Mr '15
Wood and coal as fuel for steam boilers. H. B. Reynolds. tables Sibley J 30:14-20 O '15

See also Briquets; Clinkers; Coal ashes; Coal handling; Coal lands; Coal mines and mining; Coal-tar colors; Coal-tar products; and other headings beginning Coal; Coaling; Coaling stations; Coke; Fuel economy; Gas; Lignite Lignite

#### Analysis

Analysis of coal with phenol as a solvent. S. W. Parr and H. F. Hadley, il diags Ill U Eng Exp Sta Bul 76:1-41 '14; Abstract. Am Soc M E J 37:128-9 F '15

omparison of various modifications of the Kjeldahl method with the Dumas method of determining nitrogen in coal. A. C. Fieldner and C. A. Taylor. J Ind & Eng Chem 7: 106-12 F '15; Same. U S Bur Mines Tech Pa henol for Comparison of

Phenol for coal analysis. Sci Am S 79:339 My

Sampling and analysis of coal. A. C. Fieldner. diags U S Bur Mines Tech Pa 76:1-58 '14 See also Coal sampling

### Clinkers

See Clinkers

#### Specifications

Outline specification of coal, M. B. Smith, Power 42:770 N 30 '15 Purchase of coal on specifications. Power 42: 47 Jl 13 '15

# Testing

See Coal testing

## Transportation

Anthracite coal rates reduced in Pennsylvania. Ry Age 57:1195 D 25 '14 Decision on anthracite rates. Ry R 57:215, 250-3 Ag 14-21 '15

Decision on transportation of railroad fuel. Ry

R 57:269 Ag 28 '15 Hearings on western freight rate advances. By Age 55:740-2 Ap 2 15

Reductions ordered in rates on anthracite coal.

Ry Age 59:313-18 Ag 20 '15 Too much prosecution of the anthracite rail-roads. Ry R 56:18-19 Ja 2 '15

Coal, Pulverized

oal, Pulverized
Anaconda coal-pulverizing plant, E. P. Mathewson, il plan Eng & Min J 100:45-8 Jl 10 '15
British Portland cement making machinery, il diags Engineer 120:102-5 Jl 30 '15
Coal-dust fired reverberatories at Washoe reduction works. L: V. Bender, Am Inst Min E
Bul 97:73-81 Ja '15; Abstract, Am Soc M E J
37:188-9 Mr '15; Abstract, Met & Chem Eng
13:184 Mr '15
Coal-dust fired reverberatory, furnaces: discus-

13:184 Mr '15
Coal-dust fired reverberatory furnaces; discussion of the papers of D: H. Browne, L: V. Bender and R. E. H. Pomeroy. Am Inst Min E Bul 101:117-86 My '15
Coal-dust fired reverberatory furnaces of Canadian copper co. D: H. Browne. diags Am Inst Min E Bul 97:49-60 Ja '15; Same cond. Met & Chem Eng 13:182-4 Mr '15; Abstract. Am Soc M E J 37:187 Mr '15
Comparative furnace efficiency. R. J. Weitlaner. Met & Chem Eng 13:357-61 Je '15

Comparison of the economy of powdered coal, oil and water gas for heating furnaces. C. F. Herington. Eng N 72:1156-8 D 10 '14

Feeding reverberatory furnaces along the side walls. D: H. Browne. Eng & Min J 99:412-13 F 27 '15

Firing with coal dust. E. B. Wilson, Colliery 36:125-7 O '15
Modern plant for rolling iron: St. Louis screw co. H. C. Estep. il diags plans Iron Tr R 57:82-9+ Jl 8 '15
New iron mill equipped to assure low costs. O. J. Abell. il diags plan Iron Age 96:71-7
Jl 8 '15

O. J. Abell. 11 diags plan Iron Age 96:71-7
JI 8 '15

New system for burning powdered coal in metallurgical furnaces. C. F. Herington. il plans Eng N 73:1028-30 My 27 '15

Powdered coal. W. L. Robinson. Ry Age 58: 1055-6 My 21 '15; Summary, with discussion. Ry R 56:696-7 My 22 '15

Powdered coal as central-station fuel. Elec R & W Elec'n 67:115-16, 193 J1 17, 31 '15

Powdered coal for heating furnaces. C. F. Herington. il plan Iron Age 94:1045-8 N 5 '14; Abstract. Ind Eng 14:472 D '14

Powdered coal for steam boilers. Elec Ry J 45:1014-15 My 29 '15

Powdered coal, its preparation and use in locomotives and stationary boilers. W. L. Robinson. Ry K 56:772-6 Je 5 '15; Abstracts. Ry Age (Mech ed) 89:271-3 Je '15; Power 41: 193-4 Je 8 '15; Colliery 35:646-8 J1 '15; Eng & Min J 100:19 J1 3 '15; Sci Am S 80:139 Ag 2' 15

Powdered coal plant at Anaconda. L: V.

Powdered coal plant at Anaconda. L: V. Bender. il diag Met & Chem Eng 13:333-5

Powdered coal preparation and firing in Ger-many, il diags Am Soc M E J 37:648-50 N

Problems in burning powdered coal. A. S. Mann. il diags Gen Elec R 18:920-4, 959-65 S-O '15; Same. Iron Age 96:632-4 S 16 '15 Pulverized coal burning in the cement industry. R. C. Carpenter, il diags plan Am Soc M E J 36:337-46 O '14; Abstract. Ind Eng 14:331-3 Ag '14; Abstract. Colliery 35:529-30 My '15.

My '15
Pulverized coal for steam making. F. R. Low.
diags Power 40:35-8 J1 7 '14; Same. Am Soc
M E J 36:346-52 O '14; Same cond. Ind Eng
14:333-6 Ag '14; Abstracts. Colliery 35:530-2
My '15; Heat & Ven 12:34-7 Ag '15
Pulverized fuel for locomotives. Ry Age 58:9413 Ap 30 '15; Same. Ry Age (Mech ed) 89:
213-15 My '15; Same cond. Eng M 49:440-1

Raw coal in blast furnaces. Iron Age 96:525

Steamships burn pulverized coal, Metal Work

84:437 O 1 '15 Storage of powdered coal. E: J. Kelly. Eng & Min J 100:312-13 Ag 21 '15

Coal ashes
Fusibility of coal ash in mixtures of hydrogen
and water vapor. A. C. Fieldner and A. L.
Feild. il diags J Ind & Eng Chem 7:742-7

Fusibility of coal ash in various atmospheres. A. C. Fieldner and A. E. Hall, diags J Ind & Eng Chem 7:399-406, 474-81 My-Je '15

Loss of combustible in ashes. Power 42:683-4 N 16 '15

New method and furnace for the determination of the softening temperature of coal ash under fuel-bed conditions. A. C. Fieldner and A. L. Feild. il diags J Ind & Eng Chem 7:829-35 O '15

See also Clinkers

Coal breakers Coal breaker and scraper. J. P. Considine. il diag Power 42:502-3 O 12 '15 Rapid erection of steel coal breaker. C. S. Phillips. il Eng N 74:1-2 Jl 1 '15

Inited States mining statutes annotated; Sherman antitrust act—coal companies. J. W. Thompson. U S Bur Mines Bul 94; pt 2, 1235-6 '15 Coal companies United

Coal cutters
Track work with center cutting machines, il
diags Colliery 36:28-9 Ag '15

Coal distillation Letter from Norton H. Humphrys, Salisbury, England. Am Gas Light J 102:345-6 My 31 '15

Maximum contents of hydrocarbons in producer gas; abstract. F. Hoffmann. Am Soc M E J 37:603 O '15

Coal distillation -Continued

Mode of decomposition of coal by heat. H. C. Porter and G. B. Taylor. diags Am Gas Inst Pro 9:pt 1, 234-83; Discussion. 9:pt 1, 283-8

Bibliography

Bibliography of the chemistry of gas manufacture. W. F. Rittman and M. C. Whitaker. U S Bur Mines Tech Pa 120:5-7 '15

Coal docks. See Coal handling

Coal drying

Centrifugal coal drier, il diag Iron Tr R 56:

673 Ap 1 '15 Drying of coal for briquetting, il Eng M 48: supl-3 F '15 Coal dust

American coal-dust investigations. G: S. Rice.

Colliery 36:39-42 Ag '15 Coal-dust explosion experiments. J. D. Morgan, diag Colliery 35:549-51 My '15 Field coal-dust explosion gallery, il Colliery

35:605 Je '15 Humidity of mine air. R. Y. Williams. il map U S Bur Mines Bul 83:1-63 '14

See also Coal, Pulverized

Coal dust as fuel. See Coal, Pulverized

Coal gas. See Gas

Coal handling

Alternating-current coal hoist, R. E. Brown, il Am Inst E E Pro 34:615-22 Ap '15; Abstract, with discussion, Elec R & W Elec'n 66:781-2 Ap 24 '15; Discussion, Am Inst E E Pro 34:2895-914 N '15

Pro 31:2895-914 N '15 Big consumer's storage yard: handling large quantities of coal at the New York Edison co.'s plant at Shadyside, N. J. J. F. Springer, il Colliery 35:345-8 F '15 Bituminous coal storage, il Colliery 35:231-5 D

Car dumping machines on the Hocking Valley railway's coal dock, Toledo, Ohio, if Ry R 56(207 F 13 15

Coal and ash handling at the gorge plant of the Northern Ohio traction & light co. A. D. Williams. Il diag Power 42:398-400 S 21 '15 Coal handling at Panama. Il plans Power 42: 106-10 Jl 27 '15; Abstract. Eng M 50:441-3

106-10 Jl 27 '15; Abstract. Eng M 50:441-3 D '15 Coal loading plant at Workington harbour, il diags Engineer 120:16 Jl 2 '15 Coal pier with car-dumping machine at Sandusky. il diags Eng N 73:165-7 Mr 11 '15 Coal-weighing larries. il Power 41:17 Ja 5 '15 Electrically operated coal plant. il Elec W 65: 994-5 Ap 17 '15 Electricity in a coal-handling plant. R. M. Hale. il Elec R & W Elec'n 65:1165-8 D 19 '14 Export coal terminal of the Southern railway at Charleston, S. C. il Ry R 57:620-1 N 13 '15; Iron Age 96:974-5 O 28 '15 Fuel stations; committee report. diags Ry R 56:679-82 My 22 '15; Ry Age 58:1060-1 My 21 '15; Ry Age (Mech ed) 89:275-7 Je '15 Improved performance with old-type coaling facilities, J. S. Williams. Ry Age (Mech ed) 89:66 F '15

novements in small coaling stations, il diags Eng N 74:300-1 Ag 12 '15
Italian machine for loading coal tenders, il Sci Am 113:225 S 11 '15
Large coal handling gantry crane, il Iron Tr R 57:442 S 2 '15

Mechanical handling of coal and ashes in the power plant. C. C. Brinley, il diags Eng M 49:872-87; 50:65-77 S-O '15

New coal dock for the Cincinnati, Hamilton & Dayton at Toledo, il plan Ry Age 59:273-4 Ag 13 '15; Same. Ry R 57:236-9 Ag 21 '15; Same cond. Eng Rec 72:163-4 Ag 7 '15

New Southern railway coaling pier at Charleston, S. C. il plan Int Marine Eng 20:151-3

Pennsylvania coal dock at Sandusky. il plan Ry Age 57:1189-91 D 25 '14 Rapid car dumping plant, Toledo, O. il Iron Age 95:1388 Je 24 '15

Rapid coal handling plant on the lakes. il Int Marine Eng 20:338 Ag '15

River terminal at East St. Louis, Ill. diags Eng N 74:543 S 16 '15

Telphers expedite coal movement at German plant. A. Gradenwitz, il Eng Rec 71:615 My 15 '15

Toledo coal dock built in record time. il plan Eng N 74:520-2 S 9 '15 White power-hoisting coal body, il Automobile 32:423 Mr 4 '15

See also Coaling; Coaling stations

Coal lands

Abstracts of current decisions on mines and mining, October, 1914, to April, 1915. J. W. Thompson. U S Bur Mines Bul 101:6-9 '15 Appraisal of coal land for taxation. H. M. Chance. Am Inst Min E Bul 91:1461-6 Jl '14; Discussion. 100:868-76 Ap '15 Coal fields of South America. W. G. Burroughs. Colliery 36:30-1, 72-3, 153-5 Ag-O '15 Principle of coal evaluation. R. W. Coulthard. Colliery 36:22 Ag '15 Russia—its future as a coal and iron producer. C: R. King. map Eng M 48:481-92 Ja '15 Status of Alaska coal land leasing. Eng & Min J 99:350 My 15 '15 United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:pt 1,

J 99:850 My 15 12 United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:pt 1, 724-828; pt 2, 887-97 '15 Valuation of coal lands. F. G. Welles. Colliery 36:161-2 O '15

Valuation of coal lands. W. E. Fohl. Colliery 36:64-6 S

See also Coal mines and mining

Coal meters

Recording power plant operations. J. C. Small-wood, il diags Eng M 49:818-36 S '15

Coal miners

Investments in Iron river district with partic-Investments in Iron river district with particular reference to welfare work. C. A. Tupper, il Iron Tr. R. 56:759-64+ Ap. 15 '15 Methods of adjusting mining rates. L. Gluck. Colliery \$5:349-53 F '15 Miners' minimum wage in Yorkshire, Engineer 119:66-7 Ja. 15 '15 Miners' wage crisis. Engineer 119:284-5 Mr. 19

Miners' wages and hours; the West Yorkshire mining dispute, Engineer 119:140 F 5 '15 Plea for the West Virginia miner. M. W. Jordan, il Colliery 35:310-12 Ja '15 Welfare work at Glen White. G: D. Evans. il Colliery 35:473-5 Ap '15 What the miners are aiming at—nationalisation. Engineer 120:94 Jl 23 '15

Coal mines and mining

oal mines and mining
Arching in collieries. R. G. Clark. diags Colliery 35:292-6 Ja '15
Boiler plant of the Bessemer coal and coke company; using as fuel a mixture of coal and slate. W. O. Rogers. il diags plan Power 41:7'98-801 Je 15 '15
Carney-Cherokee coal co.'s stripping. W. S. Russell. Colliery 36:173-4 O '15
Central-station power in coal-mining operations. T: R. Hay. il Eng M 48:833-48 Mr '15
Coal mine engineer. C: O. Klepser. Colliery 36:93-5 S '15
Coal mined by machines. E. W. Parker. Sci.

Coal mined by machines, E. W. Parker, Sci Am S 79:395 Je 19 '15 Coal mining problem; hydraulic stowage, En-gineer 118:526 D 4 '14 Coal stripping in Illinois, il Colliery 36:69-72 S '15

S 15 Coal stripping in Kansas. W: Z. Price. il Colliery 35:285-8 Ja '15 Colliery repair shops. W: Z. Price. il Colliery 35:269-71 D '14 Competition and legal restraint of cooperation in coal mining. Ry R 56:478-9 Ap 3 '15

Cost factors in coal production. W: H. Grady. diags Am Inst Min E Bul 101:1035-64; Discussion. 101:1064-72; 103:1469-70 My, JI '15

Dewatering an anthracite mine. W: Z. Price, il diags Colliery 36:87-90 S '15

Efficiency in coal mining, G: S. Brackett, Colliery 35:588-92 Je '15

Gas and oil wells through coal seams; discussion. Am Inst Min E Bul 100:846-58 April 10

Labor factor in bituminous mines. G: S. Brackett. Colliery 36:99-100 S '15

Lucerne power plant and tipple of the Rochester & Pittsburg coal and iron co. C. M. Young. il Colliery 36:1-6 Ag '15

Coal mines and mining . Continued

Mining institute meetings: winter meetings of the Illinois coal mining institute, the Coal mining institute of America, and the Ken-tucky mining institute. Colliery 35:325-8 Ja

'15
Mining steep thick coal beds, W. G. Whildin, diags Colliery 35:354-64 F '15
Practical economy at coal mines, L. G. Hauger, Colliery 36:128-31 O '15
Questions selected from those asked at an examination for mine foreman, held in Price, Utah, September 15 and 16, 1914. Colliery 35:217-20, 276-9, 338-41 N '14-Ja '15
Rock work in coal mines il diese Colliery 35:

Solution 276-9, 338-41 N '14-Ja '15 Rock work in coal mines. il diags Colliery 35: 237-40 D '14 Stresses in the mine roof. R. D. Hall. diags Am Inst Min E Bul 105:2013-21 S '15 Stripping at the National colliery. il Colliery 35:598-9 Je '15

Surveying in anthracite mines. W: Z. Price, diag Colliery 35:461-4, 541-3 Ap-My '15 Theory of the arch in mining. B. S. Randolph. Colliery 35:427-9 Mr '15

See also Coal dust; Coal handling; Coal lands; Coal mining machinery; Mining engi-

## Accidents and explosions

American coal-dust investigations. G: S. Rice. Colliery 36:39-42 Ag '15
Coal-dust explosion experiments. J. D. Morgan. diag Colliery 35:549-51 My '15
Coal-mine explosions caused by gas or dust. H. N. Eavenson. Am Inst Min E Bul 94:2637-60 O '14; Discussion. 100:879-85 Ap '15
Dangerous months in coal mining. Colliery 35: 309 Ja '15

309 Ja '15

309 Ja '15
Drowning of Higashimisome colliery. S. Meguro. diags Colliery 36:19 Ag '15
Fatalities at coal mines during 1914. A. H. Fay. Colliery 35:604-5 Je '15
Fatalities at coal mines during 1914 compared with previous years. Sci Am 112:228 Mr 6

Fatalities in coal mines caused by explosives: table. A. H. Fay. U S Bur Mines Tech Pa table. A. 107:14 '15

107:14 '15
Hillcrest, Alberta, explosion: a description of the mine, the ventilation, and general conditions. Colliery 35:318-20 Ja '15
Hojo coal mine, in Japan. S. Meguro. il map Colliery 35:575-80, 637-43 Je-Jl '15
Layland, W. Va., mine disaster. il Colliery 35: 556-8 My '15

Layland, W. Va., mine disaster. il Colliery 35: 556-8 My '15
Limits of mining under heavy wash. D. Bunting. diags plan Am Inst Min E Bul 97:1-21
Ja '15; Discussion. 101:1187-9 My '15
Methods of preventing and limiting explosions in coal mines. G: S. Rice and L. M. Jones. diags pls U S Bur Mines Tech Pa 84:1-42
'15

Occurrence of explosive gases in coal mines. N. H. Darton, bibliog diags maps U S Bur Mines Bul 72:1-237 '15
Roof falls in the northern anthracite fields. Colliery 35:386 F '15
Royalton mine explosion, il plan Colliery 35: 263-8 D '14

Safe use of electricity in coal mining. W. M. Thornton. Sci Am S 78:398-400 D 19 '14

Tripp shaft disaster. W. Z. Price. diag Colliery 35:321-2 Ja '15

See also Coal mines and mining—Safety measures; Mine rescue work

#### Explosives

Permissible explosives tested prior to March 1, 1915. S. P. Howell, U.S. Bur Mines Tech Pa 100:1-14 '15

Tolerances in tests of permissible explosives. J Ind & Eng Chem 7:716-17 Ag '15

## Government ownership

Government ownership and the miner. E. L. Bailey. Colliery 35:490-1 Ap '15

### Safety measures

Electric shot firing in Kansas, C. B. Carpenter, diag Colliery 35:596-8 Je '15
Firedamp detector; abstracts, H. R. Webster, diag Eng M 49:108-9 Ap '15; Colliery 36:67-8 S '15

Gas-detecting apparatus. W. G. McMillan. Colliery 35:611 Je '15
Humidity of mine air. R. Y. Williams. il map
U S Bur Mines Bul 83:1-63 '14
Method of preventing and limiting explosions
in coal mines. G: S. Rice and L. M. Jones.
diags pls U S Bur Mines Tech Pa 84:1-42

Protective system for coal mines, N. D. Levin, il Colliery 36:135-6 O '15 Safety inspection system of the Susquehanna coal co. E. C. Curtis. Colliery 35:807-8 Je

'15
Safety methods and organization of United States coal & coke co. H. N. Eavenson. Am Inst Min E Bul 98:413-30 F '15; Discussion. 101:1075-95 My '15
Shot firing in coal mines by electric circuit from the surface. G: S. Rice and H. H. Clark. Am Inst Min E Bul 94:2563-71 O '14; Discussion. 100:885-91 Ap '15
What a miner can do to prevent explosions of gas and of coal dust. G: S. Rice. U S Bur Mines Circ 21:1-21 '15

See also Mining engineering-Safety meas-

#### Alaska

Chignik bay, Alaska, coal fields. W. R. Crane. il map Colliery 35:457-61 Ap '15

#### British Columbia

Comox mines, Vancouver Island, B. C. L. Netland. il map Colliery 36:59-63 S '15

#### Canada

Coal resources of Canada. F. D. Adams. Colliery 35:627-9 Je '15

## Illinois

Early days of coal mining in Illinois, W. Rutledge, diag Colliery 36:142-4 O '15

Hojo coal mine, in Japan. S. Meguro. il map Colliery 35:575-80, 637-43 Je-Jl '15

Advantages of the western Kentucky field. F. V. Ruckman. Colliery 35:488-9 Ap '15

Harlan coal field in southeastern Kentucky. R. J. Sampson. Colliery 35:371-4 F '15

Harlan, Ky., coal field. W. R. Peck. Colliery 35:649-55 Jl '15 Plant of Yellow creek coal co. R. J. Sampson. Colliery 35:498-9 Ap '15

## Montana

Bull mountain coal field, Montana. J. P. Rowe and R. Wilson. maps Colliery 36:7-11, 74-9 Ag-S '15

# Nova Scotia

ydney, Cape Breton, coal field; climatic conditions necessitating storage; large oper-ations extending under the sea. J. F. Spring-er. il Colliery 35:581-5 Je '15

## Oklahoma

Oklahoma smokeless coals. E: F. Hackett. map Colliery 35:593-5 Je '15

### Pennsylvania

Mining in the broad top coal field, W: Z. Price, il map Colliery 35:517-21 My '15
New Lawrence colliery. L: C. Madeira, il Colliery 36:92-3 S '15
Workable coal seams of western Pennsylvania, Colliery 35:297 Ja '15

# South America

Coal fields of South America. W. G. Burroughs. map Colliery 35:552-3, 643-4 My, JI

## Spitzbergen

Arctic coal; preliminary success of American interests in Spitzbergen. M. R. Berr. Eng M 49:760-1 Ag '15 Coal mining in Spitzbergen. Eng & Min J 100: 672-3 O 23 '15 Heat from Our Lady of the snow; coal-mining in the Arctic circle. H. J. Shepstone. il Sci Am 112:160 F 13 '15

## Coal mines and mining—Continued

#### West Virginia

Coal mining in West Virginia, J. E. Coleman, il Sibley J 30:21-7 O '15
E. E. White coal company mines, G: D. Evans, il Colliery 35:401-7 Mr '15
Operations in the New River field, W: Z. Price, il Colliery 35:533-7+ My '15

Coal mines and mining, Submarine
Sydney, Cape Breton, coal field; climatic conditions necessitating storage; large operations extending under the sea. J. F. Springer, il Colliery 35:581-5 Je '15

Coal mining institute of America

Annual winter meeting in Pittsburg, Dec. 8-9. Colliery 35:326-8 Ja '15

Coal mining machinery

iggest steam shovel; excavator built for stripping coal beds. diags Eng M 50:452-3

Coal mined by machines. E. W. Parker. Sci Am S 79:395 Je 19'15 Improved coal mining machinery, il Colliery 35:452-4 Mr '15

See also Coal cutters

#### Coal piers. See Coal handling

Coal preparation

loal preparation
lenefits to be derived from standard practice in the preparation of coal. H. C. Adams. Ry R 57:41-2 Jl 10 '15
lenefit of Yellow creek coal co. R. J. Sampson. Colliery 35:498-9 Ap '15
Standardization of coal preparation; abstracts. H. C. Adams. Ry Age 58:1060 My 21 '15; Ry R 56:698 My 22 '15

See also Coal drying; Coal washing

Coal sampling

oal sampling
Method of obtaining representative coal samples, diag Elec W 66:366 Ag 14 '15
Principles of coal sampling, S. W. Parr. Sci
Am S 80:15-16 Jl 3 '15
Proposed tentative method for the sampling
of coal. Power 42:34-5 Jl 6 '15
Sampling and analysis of coal. A. C. Fieldner,
diags U S Bur Mines Tech Pa 76:1-58 '14

Coal storage

Big consumer's storage yard: handling large quantities of coal at the New York Edison co.'s plant at Shadyside, N. J. J. F. Springer, il Colliery 35:345-8 F '15

Il Colliery 35:340-8 F 15
Bituminous coal storage. il Colliery 35:231-5,
298-302 D '14-Ja '15
Cleveland adopts steel coal and sand storage
bins. il diags Elec Ry J 46:1001-2 N 13 '15
Coal handling at Panama. il plans Power 42:
106-10 Jl 27 '15; Abstract. Eng M 50:441-3

Land storage of bituminous coal; the ever present factor of spontaneous combustion; abstract. G: R. Crapo. Am Soc M E J 37: 612 O '15

Railway coal-storage plants, plans Eng N 74:592-3 S 23 '15

Storage of coal. Ry Age 58:1116-19 My 28 '15

Storage of coal. Ry R 56:701 My 22 '15

Storage of coal; abstract. G. G. Bell. Elec W 66:75-6 Jl 10 '15

Storage of powdered coal. E: J. Kelly. Eng & Min J 100:312-13 Ag 21 '15

Sydney, Cape Breton, coal field; climate conditions necessitating storage; large operations extending under the sea. J. F. Springer, il Colliery 35:581-2 Je '15

See also Coal tanks

## Coal tanks

Concrete lining for steel bunkers. il Power 40: 812 D 8 '14

Coal tar

Gai tar Coal gas residuals. F. H. Wagner, diag Am Gas Light J 101:306 N 16 '14; Same. Met & Chem Eng 12:697-8 N '14; Same. Sci Am S 80:316-17 N 13 '15

Coking of coal at low temperatures with special reference to the properties and composition of the products. S. W. Parr and H. L. Olin. Ill U Eng Exp Sta Bul 79:18-22, 28, 36-9 '15; Same cond. Iron Tr R 57:1031-2 N 25

Fractional collection of crude tar. G. T. Purves. diags Am Gas Light J 102:387-90 Je

New knowledge of coal tar. H. C. Porter, Sci Am S 79:222-3 Ap 3 '15 New method of utilizing lignite coal tar; ab-stract. V: Schon. Am Soc M E J 37:403-4 Jl

Use of coal tar in flotation. W: A. Mueller. Eng & Min J 100:591-3 O 9 '15

See also Tar

## Coal-tar colors

oal-tar colors
Aniline dye situation. Met & Chem Eng 13: \$29-30 N 15 '15
Aniline dye situation. I. F. Stone. Met & Chem Eng 13:663-71 O 1 '15
Coal-tar dyes and the Paige bill; compulsory working of patents. B. C. Hesse, J Ind & Eng Chem 7:963-74; Discussion. H. E. Stonebraker; B. C. Hesse, J: 174-8 N '15
Development of coal-tar dyestuffs. Textile World 49:362-4 Je '15
Dyestuff famine. T: H. Norton. il Sci Am 113: 400+ N 6' 15
Dyestuff situation and its lesson. A. D. Little, J Ind & Eng Chem 7:237-9 Mr '15; Same, Sci Am S 79:278-9 My 1 '15
Government co-operation with our industries.

Am S 79:278-9 My 1 '15
Government co-operation with our industries.
Sci Am 112:99 Ja 30 '15
Identifying amido-H-acids. B. C. Hesse. J Ind
& Eng Chem 7:674-5 Ag '15
Industry of the coal-tar dyes. B. C. Hesse.
map J Ind & Eng Chem 6:1013-27 D '14; Excerpts. Am Gas Light J 101:401-6 D 28 '14
Lest we forget! Who killed Cock Robin? The
U. S. tariff-history of coal-tar dyes. B. C.
Hesse. J Ind & Eng Chem 7:694-709 Ag '15
Manufacture of aniline colors in the United
States. I, F. Stone. Textile World 49:236-9
My '15

Му

Manufacture of coal-tar crudes. Sci Am S 80: 261 O 23 '15

Recommendations of the New York section of the American chemical society on the en-largement of the coal tar chemical industry in the United States. J Ind & Eng Chem 6: 972-5 D '14

972-5 D 14
Two problems of the coal tar dye industry,
B. C. Hesse, Textile World 49:225-8 My 15
Who killed Cock Robin?: notes on the tariff
history of coal-tar dyes, Sci Am S 80:135
Ag 28 15
Why America does not manufacture anilin

Thy America does not manufacture anilin dyes, H. McCormack. Inland Ptr 54:545-7 Ja

See also Dye industry; Dyes and dyeing; Petroleum

Coal-tar products

cal-tar products
Carbolineum and creosote; with chart. H. H. Alcock. Am Gas Light J 103:58-9 Jl 26 '15
Coal-tar chemical industry in Germany and America. Sci Am S 80:240 O 9 '15
Coal-tar products and the possibility of increasing their manufacture in the United States. H. C. Porter. U S Bur Mines Tech Pa 89:1-19 '15; Excerpt. Eng M 49:428 Je '15
Explosives from tar. Am Gas Light J 102:279, 282 My 3 '15
Explosives trom tar products. V. B. Lewis.

282 My 3 '15

Explosives from tar products, V. B. Lewis, Am Gas Light J 102:197 Mr 29 '15

Extraction of carbolic acid from oils of the distillation of coal tar, W: Mason, diag Met & Chem Eng 13:293-4 My '15

Outline of the coal tar chemical industry. Sci Am S 80:147 S 4 '15

Position of the American tar distiller. Sci Am S 80:87 Ag 7 '15

Possibilities for coal tar industry. R. V. Sawhill. Iron Tr R 56:4-6 Ja 7 '15

Present production of crude tar products. Sci Am S 80:86 Ag 7 '15

Status of the chemical industries in the United States at the end of 1915. I, F. Stone. J Ind & Eng Chem 7:991-3 N '15; Same. Sci Am S 80:286-7 O 30 '15

See also Benzol; Coal-tar colors; Gas; Toluol

Coal testing
Factors governing the combustion of coal inboiler furnaces; a preliminary report. J. K. Clement, J. C. W. Frazer and C. E. Augustine. il diags U S Bur Mines Tech Pa 63:1-41 '14; Excerpts. Sci Am S 79:359 Je 5 '15

Coal testing -Continued

oal testing—Continued
Fuel-supply contracts and the progress of
more scientific methods of purchase and control in America and Europe. J: B. C. Kershaw. Met & Chem Eng 13:393-6 Je '15
Fusibility of coal ash in various atmospheres.
A. C. Fieldner and A. E. Hall. diags J Ind
& Eng Chem 7:399-406 My '15
Sub-bituminous coal and sawmill waste in producer plant. G: S. Wilson. il Power 42:442-3
S. 28 '15

United States mining statutes annotated; coal testing acts. J. W. Thompson. U S Bur Mines Bul 94:pt 1, 826-8 '15 See also Coal-Analysis

Coal trade

Central stations taking advantage of slump in coal market. Elec R & W Elec'n 66:109-10 Ja 16 '15

oal fields of South America. W. G. Burroughs. map Colliery 35:552-3, 643-4 My, Jl Coal

Foreign markets for coal. U S Sp Cons Rep

Foreign market 69:1-24 '15
Fuel conditions in South America. J. W. Hardy. Ry Age 58:1056-7 My 21 '15
Production of coal. Engineer 120:370 O 15 '15
United States coals available for export trade. V. H. Manning. map U S Bur Mines Bul 76:

tion, the consumption, and export facilities of the different countries of the world. E: W. Parker. Colliery 35:486-8 Ap '15 Wages and profits in the coal trade. Engineer 119:436-7 Ap 30 '15

Coal washing Automatic slate control. diag Colliery 35:260 D

Coal washer efficiency. G. R. Delamater. Colliery 35:337 Ja '15 Effect of washing Kansas coal. A. A. Potter. Power 40:901 D 22 '14 English coal washing plant at Barugh. diags Colliery 35:252-4 D '14

Coaling

De Mayo system for coaling ships, il Int

Marine Eng 20:122-4 Mr '15

English ship-coaling machine, diag Eng N 74:
649 S 30 '15

Coaling at sea

Coaling United States warships. il diag Sci Am S 79:276-7 My 1 '15 Refueling warships at sea: abstract. S. Miller. Int Marine Eng 20:17-18 Ja '15

See also Coaling vessels

Coaling stations

Cableway coaling station, il plans Ry Age  $\frac{58,3336}{19}$  F  $\frac{19}{15}$  15

Coaling and sanding station on the Virginian railway at Elmore. F. F. Harrington. il diags Eng Rec 71:22-3 Ja 2 '15' Coaling stations for the economical handling

Coaling stations for the economical Resolution of 25 to 50 tons per day. Ry Age 59:759 O

Concrete coaling station, L. & N. R. R., Lebanon Junction, Ky. il diag Ry R 56:536-7
Ap 17 '15

banon Junction, Ky. il diag Ry R 56:536-7
Ap 17 '15
Fire hazards at coaling stations. Ry Age
(Mech ed) 89:562 N '15
Fuel stations; committee report. diags Ry R
56:679-82 My 22 '15; Ry Age 58:1060-1 My 21
'15; Ry Age (Mech ed) 89:275-7 Je '15
Improvements in small coaling stations, il
diags Eng N 74:300-1 Ag 12 '15
Large coaling stations on the Panama canal.
il diag Eng N 74:254-6 Ag 5 '15
Locomotive coaling plant at Camden Town,
il diags Engineer 119:344 Ap 2 '15
Locomotive coaling plants of the Roberts &

Locomotive coaling plants of the Roberts & Schaefer type. il Ry R 56:653-4 My 15 '15

New Southern railway coaling pier at Charleston, S. C. il plan Int Marine Eng 20:151-Railway coal-storage plants. plans Eng N 74: 592-3 S 23 '15
Schraeder shallow pit coaling station. plan Ry R 56:364-5 Mr 13 '15

Shallow-pit coaling station, plan Eng N 74: 743 O 14 '15 Snow coaling station with car unloader, il diag Ry R 57:25-6 Jl 3 '15

Snow locomotive coaling station, diag Ry R 56:566-7 Ap 24 '15

Coaling vessels

U. S. collier Jason as a Christmas ship. il Int Marine Eng 20:32-3 Ja '15

Coast and geodetic survey. See United States-Coast and geodetic survey

Coast artillery. See Artillery

Coast defense

Actual and theoretical ranges of 'the United States coast defense guns. Sci Am 112:472 My 22 '15

Increasing the range of our coast defense guns. Sci Am 113:159 Ag 21 '15 Lesson of the Queen Elizabeth. Sci Am 112: 262 Mr 20 '15

See also United States-Defenses

Coast erosion. See Erosion

Coast protection. See Shore protection Coasting. See Electric railroads-Coasting

Coats

Knitting silk plated coats. Textile World 49: 361 Je '15

Shaker coats for girls, il Textile World 48:415-16 Ja '15

Cobalt

Applications of metallic cobalt: experiments conducted with cobalt and copper alloys. D. B. Browne. Metal Ind n s 12:509-10 D '14 Chemical and mechanical relations of iron, cobalt and carbon. J. O. Arnold and A. A. Read. Iron Age 95:953 Ap 29 '15 Cobalt and nickel assay. S. Fischer, jr. Met & Chem Eng 12:773-4 D '14 Electro-plating with cobalt. C: H. Buchana and T: Haddow. Metal Ind n s 13:240-2 Je '15 Electroplating with cobalt. H. T. Kalmus, C. H. Harper and W. L. Savell. J Ind & Eng Chem 7:379-99 My '15; Excerpts (Conclusions). Met & Chem Eng 13:328-9 My '15; Elec R & W Elec'n 66:873 My 8 '15; Summary. Eng M 49:422-3 Je '15 Iron-cobalt alloy, FE<sub>2</sub>CO. and its magnetic properties. T. D. Yensen. il Gen Elec R 18: 881-7 S '15

Physical properties of the metal cobalt. H. T. Kalmus and C. Harper. il J Ind & Eng Chem 7:6-17 Ja '15

Cobalt steel

Material for accelerating machine tool speeds and output. Sci Am S 79:379 Je 12 '15

Code of principles. See American electric railway association

Coffee

Detoxication of coffee. Sci Am 112:292 Mr 27

Coffee mills

Brass working ingenuity of the Arabs of the desert; a pocket coffee-mill. L. Lodian. il Metal Ind n s 13:108 Mr '15 Electric coffee mill. il Elec W 66:1219 N 27 '15

Coffee plantations Hydro-electric installation on a coffee planta-tion. J. H. Torrens. il Gen Elec R 18:219-22 Mr '15; Same cond. Eng M 49:266-7 My '15

Cofferdams

offerdams

Concrete pile and cylinder foundations at Charleston, il diag Eng N 74:926-9 N 11 '15

Contract methods and equipment for a typical Ohio river dam. K. H. Shriver, il diags plan Eng N 73:806-11 Ap 29 '15

Notable step in the building of New York's great piers; cofferdamming the North river. R. G. Skerrett. il Sci Am 113:160-1 Ag 21 '15

Progress on 46th street pier coffer-dam, New York city, il Eng N 73:908 My 6 '15

Reconstruction of piers of Little Rock Junction bridge across the Arkansas river. C. E. Smith. diags Eng & Contr 44:124-5 Ag 18 '15

River crossings on the Nepaus pipe line. E. C. Miles, il Munic J 38:219-51 F 25 '15

Unmanageable coffer-dam leak handled by freezing. il plan Eng N 73:778-9 Ap 22 '15

Wood cofferdams with bottoms sunk for bridge in swamp. C. E. Jones. diags Eng Rec 71: 534-5 Ap 24 '15

Work to start in deep cofferdam for New York pier. il Eng Rec 71:654-5 My 22 '15

See also Bridges—Foundations and piers;

See also Bridges—Foundations and piers; Piles and pile driving

Coffin, Howard Earle, 1873-Sketch, por Eng M 50:221 N '15

Sketch, por Eng M 50:221 N '15

Cohoes Falls, New York'
Central hydroelectric plant of 50,000 horsepower replaces inefficient separate units at
Cohoes. A. G. Hillberg. il diags maps Eng
Rec 71:352-4, 395-8 Mr 20-27 '15

Hydro-electric development. W. O. Rogers. il
plans Power 42:466-71 O 5 '15

Hydro-electric development of the Cohoes
company at Cohoes, N. Y. B. R. Connell.
il diags plans map Gen Elec R 18:340-52 My
'15

Redevelopment of old canal power, il diag plan Eng N 73:456-9 Mr 4 '15

Coils

Choke coils and disconnecting switches, diags Elec Ry J 46:29 Jl 3 '15 Coil-winding unit, O. P. Chubbuck, il Elec Ry J 45:1213 Je 26 '15

J 45:1213 Je 26 '15
Differential method for the determination of losses in coils. A. Hund. diags Elec W 65: 1300-1 My 22 '15
Hints on the impregnation of railway motor coils. il Elec Ry J 45:429 F 27 '15
Process of impregnating coils; and a large, modern impregnating plant. R. Reid. il Gen Elec R 18:48-51 Ja '15
Rewinding direct-current motors and generators. A. A. Fredericks. diags Power 42:76-8, 116-18, 148-50 Jl 20-Ag 3 '15

Coils, Induction. See Induction coils Coils, Reactance. See Reactance coils

Causes of coke troubles in the foundry. Iron Age 94:1348-9 D 10 '14
Coke as a fuel under boilers. G. Wirthwein. Am Soc M E J 37:558-9 S '15
Coke as fuel under boilers; abstract. H. Markgraf, diag Am Soc M E J 37:609-10 O '15
Coke in gas producers. Iron Age 96:464 Ag 26
'15; Same. Am Gas Light J 103:186 S 20 '15
Coke production in 1914. Iron Tr R 57:964b964c N 11 '15

964c N 11 '15

964c N 11 '15
Coke recovered from the cupola dump. W. J.
Keep. Iron Tr R 56:382+ F 18 '15
Coking of coal at low temperatures with special reference to the properties and composition of the products. S. W. Parr and H. L.
Olin. Ill U Eng Exp Sta Bul 79:1-39 '15;
Same cond. Iron Tr R 57:1027-34 N 25 '15;
Abstract. Met & Chem Eng 13:639 S 15 '15
Connellsville coke prices for fifteen years. Iron

Abstract. Met & Chem Eng 13:639 S 15 '15 Connellsville coke prices for fifteen years. Iron Age 95:14 Ja 7 '15 Conversion of non-coking fuels. Am Gas Light J 103:284 N 1 '15 Experience with a by-product coke oven plant. C. C. Boardman, il Am Gas Light J 102:289-94 My 10 '15 Fixed calorific standard—a new use for gas coke. N. H. Humphrys. Am Gas Light J 102: 73-4 F 1 '15 Gas coke for large heating systems. H. Reis.

Gas coke for large heating systems. H. Reis. Metal Work 84:179 Ag 6 '15 How to burn coke. Am Gas Light J 102:173

Improvement in by-product foundry coke, C. S. Lomax, Iron Age 95:1116-18 My 20 '15; Same, Iron Tr R 57:361-2+ Ag 19 '15.

Large installation of by-product coke ovens on Tyneside, il diags Engineer 119:486-8 My 14 '15.

14 '15
Making by-product coke. H. C. Estep. il diags Iron Tr R 55:1171-8+ D 24 '14
Metallic iron in coke samples. J. R. Campbell. Colliery 35:538-41 My '15
Republic company's by-product coke plant. il plan Iron Age 94:1433-8 D 24 '14
Standard specifications for the foundryman. Foundry 43:258, 260-1 Jl '15
Tall reinforced concrete coke house in Rotterdam, Holland. il Eng & Contr 44:229-30 S 22 '15
Wasteful coke production. Metal Work 84:282 Wasteful coke production. Metal Work 84:282 Ag 27 '15

See also Coal; Coke oven gas; Coke ovens

Cost

By-product coke in New York. Colliery 35:485 15 Ap '15 Coke breeze

Coke-breeze briquettes; abstracts. F. B. Behr, J Ind & Eng Chem 7:718 Ag '15; Am Gas Light J 103:134 Ag 30 '15

Use of coke breeze as concrete aggregate. W: M. Kinney; A. M. Wolf, Concrete Cem 7:115-16 S '15

Coke oven gas

oke oven gas
By-product coke oven gas for Chattanooga.
Munic Eng 48:136 F '15
Experience with a by-product coke oven plant.
C. C. Boardman, il Am Gas Light J 102:28994 My 10 '15
Municipality buys coke-oven gas. Am Gas
Light J 101:413 D 28 '14
Utilization of waste heat for the generation of
electrical energy. H. Hobson, diag Inst E E
J 53:845-6 Je 15 '15
Valuable products recovered from coke oven

aluable products recovered from coke oven gases. il diags Sci Am 112:379-80 Ap 24 '15 Valuable

Coke ovens

oke ovens

Application of by-product coke ovens to the gas industry. J. D. Forrest. Am Gas Light J 102:186-9 Mr 22 '15

Blast-furnace gas for coke ovens. O. Simmersbach. Ind Eng 15:29-30 Ja '15; Same. Iron Age 95:242-3 Ja 28 '15; Same. Am Gas Light J 102:135+ Mr 1 '15

By-product ovens at Baltimore, Md. il Am Gas Light J 102:27-8 Ja 11 '15

Carbonization in bulk—Koppers' ovens. C. J. Ramsburg. il diag Am Gas Inst Pro 9:pt 1, 543-601; Discussion. 601-14 '14

Deterioration of fireclay goods in ovens and retorts. T: Holgate. Am Gas Light J 103:113-18 Ag 23 '15

Improvements in beehive ovens. il Colliery 35:

Improvements in beehive ovens. il Colliery 35: 247-8 D '14

247-8 D '14 Improvements in by-product foundry coke. C. S. Lomax, Iron Age 95:1116-18 My 20 '15; Same, Iron Tr R 57:361-2+ Ag 19 '15 Large installation of by-product coke ovens on Tyneside, il diags Engineer 119:486-8 My

14 '15
Machine for cleaning ascension pipes, diag Am Gas Light J 103:51 Jl 26 '15
Making by-product coke, H. C. Estep, il diags Iron Tr R 55:1171-8+ D 24 '14
Manufacture and tests of silica brick for the byproduct coke oven, K. Seaver, il Am Inst Min E Bul 105:1913-27 S '15; Same, Met & Chem Eng 13:861-6 N 15 '15
Mechanical doors vs. brick doors, on beehive coke ovens. Colliery 35:644-6 Jl '15
Model of a Koppers byproduct-coke plant at the United States national museum, Washington, D. C. il Eng & Min J 100:470 S 18

Temperature conditions in coke ovens. O. Simmersbach. Am Gas Light J 102:61 Ja 25 '15 Valuable products recovered from coke oven gases. il Sci Am 112:379-80 Ap 24 '15

See also Coke oven gas

# Accidents

Coke-oven accidents in the United States during the calendar years 1913 and 1914. A. H. Fay. U S Bur Mines Tech Pa 118:1-15 '15; Excert (Coke-oven accidents, 1913). Colliery 35:409 Mr '15

Cold light Theory

heory of cold light, W. D. Bancroft, Illum Eng Soc 10:289-95 no 4 '15; Same, Am Gas Light J 103:27-8 Jl 12 '15; Same, Sci Am S 80:186-7 S 18 '15

Cold storage

Air ozonation. M. W. Franklin. J Ind & Eng Chem 6:853-4 O '14; Same. Am Soc Heat & V E 20:350-4 '14

V E 20:350-4 '14
Excessively dry air in cold stores: abstract.
W: D. Sawers. Am Soc M E J 37:52-3 Ja '15
Insulate huge concrete building for cold storage in Chicago. Eng Rec 72:662-3 N 27 '15
Pre-cooling of Canadian fruits. E. Smith. Am
Soc M E J 37:190-1 Mr '15

See also Refrigeration and refrigerating machinery; Refrigerator cars

Collecting of accounts

Billing and collecting systems of small companies. Elec R & W Elec'n 67:184-6 Jl 31 '15 Campaign to reduce delinquency; a five-year record by the American gas & electric company's properties. Elec W 65:998-9 Ap 17 '15 Credits, collections and cash discounts. W. H. Vilett. Elec R & W Elec'n 67:108-7 Jl 17 '15

Getting the money. G; M. Rittelmeyer. Metal Work 83:532-3 Ap 9 '15

Collecting of accounts -- Continued

office clerk problems—continued
Office clerk problems—collections, C: Fried.
Inland Ptr 56:186-8 N '15
Should the salesman collect money? E. E.
Whitehorne. Elec W 66:921-3 O 23 '15
Three C's lead to business success. Metal
Work 83:221-2 F 5 '15

Collective bargaining. See Trade agreements

College architecture
Gilman hall and Mechanical and electrical engineering building, Johns Hopkins university; views and plans. Brickb 24:pl 136-43
O 15

Gymnasium, Dartmouth college, Hanover, N. H.; designs. Brickb 24:pl 54-5 Ap '15 New home of Johns Hopkins university. J; M. Hammond. il Arch Rec 37:481-92 Je '15 Washington university, St. Louis, Missouri. G. Study. il plan Arch Rec 37:64-75 Ja '15

See also Dental colleges

College buildings

Central generating system for University of Michigan, il plans Elec W 65:646-51 Mr 13

715 nd framing for armory at University of Illinois and some general features of this structure, il diags Eng & Contr 43:141-3 F 15

See also College architecture; Dental colleges

College education

Education for railway work. S: O. Dunn. Ry Age 59:907-9 N 12 '15

College students

Dilege students
Enlarging the worth of the worker and the perspective of the employer. J. P. Channing. il Am Inst Min E Bul 99:529-38 Mr '15; Excerpt (Student engineers teach workmen). Iron Age 95:554-5 Mr 11 '15; Discussion. Am Inst Min E Bul 101:1095-9 My '15
Student life at Stevens. R. F. Homhan. Stevens Ind 32:57-63 Ja '15

Colleges and universities

See also Academic freedom; College buildings; College students; Engineering bureaus; Engineering colleges; Scholarships; also Throop college of technology

Collisions at sea

Stability of vessels as affected by damage due to collision. W: Gatewood. Int Marine Eng 20:156-8 Ap '15

Suction between passing ships. S. A. Reeve. diags Sci Am S 79:30-2, 46-8, 62-4 Ja 9-23 '15

See also Salvage

Colloids

Action of certain colloids on ions during electrolysis. A. Mutscheller, diags Met & Chem Eng 13:353-7 Je '15
Coagulation of arsenious sulfide sol by electrolytes. J. Mukhopâdhyâya, Am Chem Soc J 37:2024-31 S '15

J 67:2024-31 S 19 Colloidal bituminous pavement. il Munic J 38:807-8 Je 10 '15 Colloids in relation to manipulation of struc-tural materials. C. Richardson, Munic Eng 48:380-2 Je '15

48:360-2 Je '15
Electric synthesis of colloids. J. Mukhopâdhyâya. Am Chem Soc J 37:292-7 F '15
Interesting application of colloidal chemistry.
D. T. Pierce. Met & Chem Eng 13:498-9 Jl '15
Neutralization of adsorbed ions. W. D. Bancroft. Met & Chem Eng 13:318-19 My '15
New method of preparation and some interesting transformations of colloidal manganese dioxide. E. J. Witzemann. Am Chem Soc J 37:1079-91 My '15
Relative migration velocities of the ions in

Relative migration velocities of the ions in complex electrolytes. A. Mutscheller. Met & Chem Eng 13:439-42 Jl '15

Theory of the perfect sheet asphalt surface. C. Richardson. J Ind & Eng Chem 7:463-5 Je '15

See also Catalysis

Colombia

Taxes in Colombia. J. F. Dierolf. Eng & Min J 99:874 My 15 '15

## Industries and resources

Nechi mines (Colombia) ltd. Eng & Min J 99: 244-5 Ja 30 '15

Pato property of Oroville dredging company, W. A. Prichard. Eng & Min J 99:231-4 Ja 30 '15

lacers of Antioquia, Colombia. R. W. Perry. il map Eng & Min J 100:585-9 O 9 '15

Colonial architecture. See Architecture, Colonial Color

Artificial daylight. H. E. Ives, bibliog il J Fr Inst 177:471-99 My '14; Same. Sci Am S 78: 396-8, 412-14 D 19-26 '14 Standardized colored fluids. H. V. Arny and C. H. Ring. J Fr Inst 180:199-213 Ag '15

See also Coal-tar colors; Colorimeters and colorimetry; Dyes and dyeing; Light; Light, Colored; Painting; Pigments; also headings beginning Color

Color blindness

Standard tests for color blindness, il Ry Age 58:222-3 F 5 '15

Color filters. See Light filters

Color in architecture

Color in architecture at the Panama-Pacific exposition. W: L. Wollett, il Arch Rec 37: Color in architecture at the Panama-Pacinic exposition. W: L. Wollett, il Arch Rec 37: 437-44 My '15
Texture and color at the Panama-Pacific exposition, P. E. Denivelle, il Arch Rec 38: 562-70 N '15

Color matching
Gaseous-conductor lamp for color matching;
abstracts. D. M. Moore, diags Elec W 66:
1160 N 20 '15; Elec R & W Elec'n 67:949 N
20 '15; Met & Chem Eng 13:885 D 1 '15

Color music

Art of mobile color, M. Luckiesh. il Sci Am S 79:408-9 Je 26 '15 Color music; the color organ used in Scria-bine's symphony Prometheus. H. C. Plum-mer. il Sci Am 112:343+ Ap 10 '15

Color photography

Color photography. M. C. Rypinski, bibliog II-lum Eng Soc 9:579-92 no 7 '14; Same. Sci Am S 79:134-5 F 27 '15 Color sensitized plates. Sci Am S 79:240 Ap 10 '15

10 '15
Development and recent advances of the techno-graphic arts. L: E: Levy. il J Fr Inst 180:402-5 O '15
Important development in color photography; the kodachrome process of color portraiture. Sci Am 112:341+ Ap 10 '15
Sci Am 112:341+ Ap 10 '15

Photographs in natural colors. Sci Am 112: 562+ Je 5 '15

Progress in color photography. Sci Am S 79: 381 Je 12 '15

See also Moving pictures, Colored

Color printing Black and red. J. L. Frazier. Inland Ptr 54: 371-2 D '14

Dividing the form for colors. J. L. Frazier. Inland Ptr 55:213-16 My '15

Outgrowths of letterpress: color cards for the paint and varnish trade. G: Sherman. il Inland Ptr 54:490-3 Ja '15

See also Color photography

Color sense

Method of correcting abnormal color vision and its application to the flicker photometer. H. E. Ives and E. F. Kingsbury, Illum Eng Soc 10:259-70 no 3 15

Color tests

Color used in hydraulic tests of power plants. R. Taylor, diags Eng N 74:617-20 S 23 '15

Colorado

See also Gilpin county, Color and mineral resources—Colorado Colorado: Mines

Industries and resources

Bituminous shales of Colorado. G. R Beque, il Eng & Min J 99:773-4 My 1

Colorado & Southern railway 15th annual report. map Ry Age 57:1034-5, 1069-70 D 4 '14

Sixteenth annual report, map Ry Age 59:997-8, 1037-8 N 26 '15 Colorado electric light, power & railway associ-

ation Glenwood Springs,

th annual convention, Glenwood Sept. 23. Elec W 66:792-3 O 9 '15

Colorado fuel and iron company Safety-first, first-aid and welfare work of the Colorado fuel and iron company. il Met & Chem Eng 13:234-8 Ap '15

Colorado river
Reservoir sites on the Colorado river. L: C.
Hill. map Eng Rec 70:670-1 D 19 '14

Colorado school of forestry
Courses of study. il Am Fore 21:650-2 My '15

Colored light. See Light, Colored

Colorimeters and colorimetry Color of illuminants; with discussion. L. A. Jones. diag Illum Eng Soc 9:687-709 no 8 '14

Analysis of chrome yellows and greens, A. Given, J Ind & Eng Chem 7:324 Ap '15 See also Color, and references under that

subject

Subject
Columbia highway
Bridges and viaducts on the Multnomah county section of the Columbia river highway. il Good Roads n s 10:243-7 N 6 '15
Columbia highway in Oregon. H: L. Bowlby. il Eng N 73:62-4 Ja 14 '15
Oregon's state highways. H. M. White, il Munic J 39:349-52 S 2 '15
Reinforced concrete bridges along the Columbia highway in Oregon. K. P. Billner, il diags Eng & Contr 43:121-3 F 10 '15; Same. Eng N 72:1145-8 D 10 '14

Columbia university

New advanced course in electrical engineering at Columbia university. W. I. Slichter, il Gen Elec R 18:940-4 O '15

School of mines

Address at testimonial dinner, H: S. Munroe, Eng & Min J 99:998-1001 Je 5 '15

Columbium

otes on sodium columbates; the atomic weight of columbium, E, F, Smith and W, K, Van Haagen, diags Am Chem Soc J 37:1783-97 Ag '15 Notes

Columbus, Georgia

Water supply

Vorks for the improved water supply of Columbus, plans Eng & Contr 42:496-8 N 25 Works

Columbus, Ohio
City and state power plants at Columbus.
T: Wilson, il Power 42:322-6 S 7 '15

Bridges

Design features of the Alger bridge—a 1,166-ft. reinforced concrete structure, diags Eng & Contr 44:206-9 S 15 '15

Engineering lessons from the Ohio floods. J: W. Alvord. il Boston Soc C E J 1:85-108; Discussion. 1:109-17 Mr '14

Lighting

Decision for municipal light plant. Power 41: 354-5 Mr 9 '15

Sewerage

Contract plans for sewer work at Columbia. Eng N 74:1034-5 N 25 '15 Low river flow exacting for Columbus sewage works. Eng Rec 71:492 Ap 17 '15

Water supply

Columbus waterworks makes its own alum—a revolutionary step in water purification practice. C: P. Hoover, il plan Eng Rec 71: 576-7 My 8 '15; Same. Eng & Contr 43:448-9 My 19 '15

Water purification in Columbus, C: P. Hoover, Munic Eng 49:101-2 S '15

Columbus railway and light co. System of the Columbus railway and light co. il Power 42:339-41 S 7 '15

Column footings
Reinforced-concrete footings economically designed. N. M. Stineman. Eng Rec 72:300 S 4

Reinforced-concrete footings economically designed, W. A. Hoyt. Eng Rec 72:458 O 9 '15

Reinforced-concrete footings of special con-struction, diags Eng Rec 72:355-6 S 18 '15

Columns

Anchoring base plates for columns. D. N. Becker. Eng Rec 70:626 D 5 '14
Anchoring base plates for columns. E. F. Allbright. Eng Rec 70:673 D 19 '14
Column design for steel and wood construction. il Eng Rec 71:233 F 20 '15
Compression formulas for metal columns. Eng Rec 71:416-17 Ap 3 '15
Curves for strength and deflection of very long columns. E. L. Robinson. Eng N 73: 1108-9 Je 10 '15
Data on the strength and elastic properties of concrete-filled pipe columns. F. W. Swain and A. F. Holmes. Eng & Contr 44:184-5 S 8 '15
Making square-paneled porch columns. il Bldg

8 '15
Making square-paneled porch columns. il Bldg
Age 37:41 O '15
Nomographic solutions for formulas of various types. R. C. Strachan. Eng Rec 71:807-9
Je 26 '15
Waste of metal in mill-building columns.
C. L. Christensen. Eng N 73:590-1 Mr 25 '15
See also Architecture; Poles; also Perry
memorial memorial

Columns, Concrete

American concrete
American concrete institute's tests on concrete columns. Eng N 73:524-7 Mr 18 '15
Column forms hold 30 feet of wet concrete.
P. A. McGeady. il diag Eng Rec 71:470 Ap 10 '15
Concerts and

10 '15
Concrete column tests disclose effects of longitudinal and spiral reinforcement. diag Eng Rec 71:527-9 Ap 24 '15
Concrete columns—plain, rodded and hooped. E: Godfrey. Eng Rec 71:339-40 Mr 13 '15
Economy in the design of reinforced concrete columns. P. J. Waldram. Engineer 120:28-30, 52-4 Jl 9-16 '15

30, 52-4 Jl 9-16 '15 Field methods in concrete construction—column forms. J. Cochran. diags Concrete Cem 6: 187-9 Ap '15 New steel and concrete structure to furnish nearly sixteen acres of floor space; Bingham warehouse in Cleveland. diags Eng Rec 72: 357 S 18 '15 Reinforced concrete column formulae C. Gaya-

357 S 18 '15
Reinforced concrete column formulae, C. Gayler, H. C. Toensfeldt, and C: W. Martin,
Assn Eng Soc J 54:94-9 F '15; Discussion,
54:150-8 Ap '15
Reinforcing concrete columns to carry additional stories, P. R. Prufert, il diag Eng N
74:410-11 Ag 26 '15

See also Poles, Concrete

Columns, Steel
Results of recent tests of steel columns presented and discussed. Eng Rec 71:549-50 My

Steel column tests. Eng Rec 71:574 My 8 '15 Strength of columns sought by full-size tests. Eng Rec 71:136 Ja 30 '15 Tests of structural columns; record of work done at Bureau of standards. il diag Iron Tr R 56:567-9+ Mr 18 '15

Combustion

ombustion
Calculating dry flue-gas loss. C. W. Hubbard.
Power 42:746-8 N 30 '15
Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid, and naphthalene. H. C. Dickinson, bibliog U S Bur Stand Bul 11:189-257 Mr 1 '15
Combustion in locomotive fireboxes. J. P. Neff;
J. T. Anthony, diag Ry Age 58:55-7 Ja 8 '15;
Same cond. Ry Age (Mech ed) 89:10-11 Ja

Combustion of coal in domestic heaters. R. V Davenport. Metal Work 83:928-9 Je 25 '15

Factors governing the combustion of coal in boiler furnaces; a preliminary report. J. K. Clement, J. C. W. Frazer and C. E. Augustine. il diags U S Bur Mines Tech Pa 63:1-41 '14; Excerpts. Sci Am S 79:359 Je 5 '15

Flame and combustion. W. A. Bone. Engineer 120:357 O 15 '15

Heats of combustion of aromatic hydrocarbons and hexamethylene. T. W. Richards and F. Barry. il Am Chem Soc J 37:993-1020 My

How much CO<sub>2</sub> to expect with various kinds of fuel. V: J. Azbe. Power 42:712-14 N 23 '15

Combustion - Continued

Notes on fans. A. A. Potter and S. L. Simmering, Power 41:816 Je 15 '15

figured of the combustions. M. Reimer. Am Chem Soc J 37:1636-8 Je '15
Relation of factors influencing combustion.
C. W. Hubbard. Power 42:313-14 Ag 31 '15 See also Fuel; Mechanical draft; Smoke

Combustion, Spontaneous. See Spontaneous combustion

Combustion, Surface

Design of surface combustion appliances. C: E. Lucke. diags Sch Mines Q 36:95-122, 233-48 Ja-Ap 15; Abstract. Met & Chem Eng 13:729 O 15 15

Surface combustion appliances, il Mach 21: 768-9 My '15

Comfort stations. See Public comfort stations

Commerce

Mainstreams of seaborne commerce; map. Eng & Min J 99:141 Ja 16 '15

See also Accounting; Advertising; Banks and banking; Business; Business depression; Competition; Credit; Export trade; Government regulation of industry; International law; Interstate commerce commission; Manufactures; Monopolies; Partnership; Railroads; Rivers; Salesmen and salesmanship; Shipping; Tariff; men and salesmanship; Shipping; Tariff; Trusts, Industrial; Waterways; also names of countries, subhead Commerce, also Eu-ropean war—Commercial and financial as-

Commercial associations

Wolfe, US Bur For & Dom Com 98:1-75 '15 See also American international corpora-tion; Chambers of commerce

Commercial correspondence Supervision of postage stamps, Horseless Age 35:262 F 24 '15

See also Sales letters

Commercial crises. See Panics

Commercial law

Anti-dumping legislation in Canada, South Africa, and Australia. Textile World 50:176-

Australia anti-dumping law. Iron Age 96:887

Commercial laws of England, Scotland, Germany and France. A. J. Wolfe and E. M. Borchard. U S Bur For & Dom Com 97:1-106

See also Arbitration, Industrial; Contracts; Landlord and tenant; Negotiable instru-ments; Partnership; Property; Public ser-vice corporations; Sales; Trusts, Industrial

Commercial paper. See Negotiable instruments

Commission on industrial relations. See United States—Commission on industrial relations Commissions

Commission plan for control of public works. Eng N 73:1186-8 Je 17 '15 Limitations of government by commissions. Ry Age 58:220 F 5 '15

Community courts. See Apartment houses

Commutation (electricity)
Commutation at overloads; abstract. M.
Walker. diags Elec W 66:819-20 O 9 '15
Criteria for the quality of commutation; examination of those proposed by Arnold and Hobart. J. F. H. Douglas. Elec W 65:601-2

Factors affecting commutation. A. H. Brame. diags Power 41:836-8 Je 22 '15

Commutators

ommutators
Cleaning commutators, diag Elec R & W
Elec'n 67:760, 899 O 23, N 13 '15
Emery around a seriamo, E: J. Oppenheim.
Power 41:275-6 F 23 '15
Emery around a dynamo, W. Weaver, Power
40:855 D 15 '14
Filling holes in commutator, L. L. Pollard,
diags Power 41:690 My 18 '15
Gas heater for commutators, R. H. Parsons, diags Elec R\* J 65:200 Ag 14 '15
Graphite brushes, Colliery 36:167-8 O '15
High mica commutator trouble. Automobile
32:1078 Je 17 '15

Los Angeles commutator slotter. E. L. Stephens. il Elec Ry J 46:321-2 Ag 21 '15
Physical limitations in D-C. commutating

machinery. B. G. Lamme. Am Inst E E Pro 34:1559-1614 Ag '15

se commutator machines and the tion. N. Shuttleworth. Inst E F 57; Discussion. 53:457-66, 805-8 Mr Polyphase

Schweitzer multiplex brush for commutators and collector rings. il Elec R & W Elec'n

Self-lubricating brush substitute. P. Justus. diags Power 42:519 O 12 '15

diags Power

diags Power 42:519 O 12 '15
Slotting commutators in the motor shell. J. G.
Koppel, diag Elec Ry J 45:847 My 1 '15
Troubles encountered in the operation of carbon brushes in direct-current generators and motors. E. H. Martindale. il Am Inst E E Pro 34:373-84 Mr '15; Same cond. Power 41:558-9 Ap 20 '15; Same cond. Engineer 119:468-9 My 7 '15; Same cond. (Causes of poor commutation and remedies)
Elec W 65:863-4 Ap 3 '15; Discussion. Am Inst E E Pro 34:2966-74 D '15
Turning commutators in the power house.
H. L. Loucks. diags Ry Age (Mech ed) 89: 470 S '15
What commutator appearance indicates. V. A.

What commutator appearance indicates, V. A. Clarke, Power 42:514-15 O 12 '15 What the operator should know about slotted commutators, Elec W 66:756 O 2 '15

See also Dynamos; Electric motors

Company stores. See Cooperation

Compass

Compass surveying. R: Bowen, Colliery 35: 417-18 Mr '15

Compass, Prismatic

Prismatic compass. il diag Sci Am S 79:356 Je 5 '15

Compensators. See Electric transformers; Phase

Competition

ame of killing off your competitor. J. C. Morrison. Inland Ptr 54:540-1 Ja '15 See also Monopolies; Trusts, Industrial

Competition, Unfair
First indication of what the courts will consider unfair competition under recent laws.
E. J. Buckley. Elec R & W Elec'n 67:296 Ag
14 '15

French law on unfair competition. D. C. Poole,

jr. Textile World 49:032-4 S '15 Law as to unfair competition and imitation of labels and dress of goods. Dom Eng 73: 177 N 6 '15

Composing machines. See Typesetting machines

Composing sticks
History of composing-sticks, W; Sells, il Inland Ptr 54:839-40 Mr '15

Compound words

ompound words
Careless punctuation, W. P. Root. Inland Ptr
54:636-8 F '15
Compounds and use of the hyphen. F. H.
Teall. Inland Ptr 55:343-4 Je '15
Further elements in the use of hyphens. W.
Rice. Inland Ptr 55:663-4 Ag '15
Go-as-you-please English. F. H. Teall. Inland
Ptr 55:82 Ap '15
Use of the hyphen. F. H. Teall. Inland Ptr 54:
347-50 D '14

Compressed air

iompressed air
Air cooling plant, New York Central R. R.,
Mott Haven yard, New York. M. Purcell
and M. F. Gannon. il plans Ry R 56:708-5
My 22'15
Bihn-Jones automatic air device for raising
or handling large quantities of liquids.
diags Met & Chem Eng 13:876-7 N 15'15
Caulking lead joints with compressed air at
Waltham, Mass. Eng & Contr 42:290-1 S 23

'14
Compressed air as source of power: advantages of pneumatic power tools, C: C. Phelps, Metal Work 82:822+ D 25'14
Compressed air moulding machine. il diags Engineer 119:129-90 F 19'15
Compressor plant and pipe line arrangements for Sandy Ridge tunnel lining; plan. Ry R 57:331 S 11'15

Compressed air—Continued
Fighting the sea with compressed air. R. G.
Skerrett, il Sci Am 112:97 Ja 30'15
Floating a stranded ship on air; refloating the
steamship Zeeland. R. G. Skerrett, il Sci Am
112:84 Ja 23'15

ow compressed air saved the steamship Floriston, R. G. Skerrett, il diag Int Marine Eng 20:270-1 Je 15

Moisture in yard testing plants. Ry Age (Mech ed) 89:295-6 Je '15

Pneumatic track tamping, il Eng Rec 70:689

Records of operation in handling concrete with compressed air. il diag Concrete Cem 5:

compressed air. Il diag Concrete Cem 5. 260-3 D '14
Refloating the steamship Zeeland by compressed air. R. G. Skerrett. Int Marine Eng 20:87-8 F '15
Return-pipe compressed-air practice. F. Richards. Power 41:224-5 F 16 '15
Tunnel lining by compressed air, il Ry Age 57:1143-4 D 18 '14
Ling compressed air to clean sand out of

sing compressed air to clean sand out of driven wells at Detroit, il Eng & Contr 44: 386 N 17 '15

See also Air compressors; Air lifts; Pneu-atic tools; Pneumatic tubes; Vacuum

#### Cost

Cost of compressed air. T: F. Crawford. Ry Age (Mech ed) 89:364-5 Jl '15

Compressed air meters
Automatic air meter for foundries, il Foundry
43:168 Ap '15; Ry Age 58:455 Mr 12 '15; Iron
Age 95:737 Ap 1 '15; Eng & Min J 99:1077-8

Compressed-air meter, il Eng & Min J 98: 1100-1 D 19 '14

Meter for measuring rate of flow of compressed air, il Sci Am 113:364+ O 23 '15

Compressibility
Compressibilities of mercury, copper, lead, molybdenum, tantalum, tungsten and silver bromide. T. W. Richards and E. P. Bartlett, diag Am Chem Soc J. 37:470-81 Mr. 15
Concerning the compressibilities of the elements, and their relations to other properties. T. W. Richards. Am Chem Soc J. 37: 1643-56 Jl. 15
Preserve aspect of the hypothesis of com-

resent aspect of the hypothesis of compressible atoms. T. W. Richards, bibliog Am Chem Soc J 36:2417-39 D '14

See also Elasticity

Compressing machines
Hydraulic ring compressing machine, il Iron
Age 94:1443 D 24 14

Compressors. See Air compressors; Ammonia compressors

Compulsory education

Pennsylvania's new compulsory continuation schools. H. E. Miles. Am Ind 16:28-9 N '15

Computing machines. See Calculating machines Comstock lode

Comstock lode in 1914. Eng & Min J 99:155-6 Ja 16 '15

Men and machinery of the Comstock—pioneer hoisting works. G. W. Dickie. il Eng & Min J 98:1130-4 D 26 '14

Men and machinery of the Comstock—the combination shaft, G. W. Dickie, il Eng & Min J 98:990-4 D 5 '14

Concentrating tables

Development of ore concentration. H: A. Marvin. il Eng M 49:222-5 My '15

Development of the Butchart riffle system at Morenci. D: Cole, il diags Am Inst Min E Bul 98:431-44 F '15; Excerpt. Met & Chem Eng 13:332 My '15; Discussion. Am Inst Min E Bul 101:1123-8 My '15

Riffling for concentrating tables, il Met & Chem Eng 13:819-20 N 1 '15

Rotary concentrator and classifier. il Eng & Min J 100:358-9 Ag 28 '15

Wright concentrating table. C. W. Wright. diags Eng & Min J 100:641-3 O 16 '15

Concentration camps
Science in German concentration camps. A.
Gradenwitz. il Sci Am 113:10-11 Jl 3 '15

Concentration cells
Potassium chloride concentration cells. D. A.
MacInnes and K. Parker, diags Am Chem
Soc J 37:1445-61 Je '15
Potential of silver against silver ion in concentrated solutions of potassium and of sodium chloride, and its relation to the activities of such solutions. G: S. Forbes and F: O. Anderegg. Am Chem Soc J 37:1676-85 Jl '15

Concrete

Concrete a plague-eradicator in New Orleans. H. P. Letton. Eng Rec 71:325-6 Mr 13 '15 Concrete versus stone revetment, in the Kaw valley levee work. E. B. Murray. il Concrete Cem 6:202-4 Ap '15 Effect of proportions on density and strength of gravel concrete. R. W. Crum. Eng & Contr 43:314-15 Ap 7 '15 Experiences with concrete in the republic of Panama. A. P. Crary. il diags Eng N 73: 214-16 F 4 '15 Field methods in concrete construction.

214-16 F 4 '15.
Field methods in concrete construction—a consideration of materials. J. Cochran. Concrete Cem 6:31-2 Ja '15
Fire-resisting qualities of concrete. W: M. Kinney. Concrete Cem 6:40 Ja '15
High-strength concretes produced through lowering of surface tension of mixing water. N. C. Johnson. il Eng Rec 71:320-4 Mr 13 '15
Hydrated lime in spouted concrete. G. J. Griesenauer. Concrete Cem 7:188 N '15
Lime concrete extensively used in India and Burma. Eng Rec 71:797-8 Je 26 '15
Mechanical disintegration of defective concretes. N. C. Johnson. il Eng Rec 71:160-4
F 6 '15
Microscope as a check on construction. N. C.

Microscope as a check on construction. N. C. Johnson. il Eng Rec 71:263-5 F 27 '15 Microscope as an aid in proportioning concrete for strength: ratio of cement to aggregate burden. N. C. Johnson. il Eng Rec 71:194-7 F 13 '15

Microscope opens new field in study of con-crete, N. C. Johnson, il Eng Rec 71:98-102 Ja 23 '15

Grete. N. C. Johnson. It Eng. Rec 1188 state Ja 23 '15

Microscope shows importance of mixing as a factor in making strong concrete. N. C. Johnson. Eng Rec 71:301-3 Mr 6 '15

Oil-mixed Portland cement concrete. L. W. Page. U S Agric Bul 230:1-26 '15; Abstract. Eng & Contr 44:227-9 S 22 '15; Excerpt. Eng Rec 72:334-5 S 11 '15; Excerpt (Oil-mixed concrete for damp proofing) Munic Eng 48:375-6 Je '15; Same. Bldg Age 37:24

JI '15; Same. Am Gas Light J 103:29 JI 12

'15; Same. Concrete Cem 7:30 JI '15

Quality of concrete controlled by tests of sand. C. M. Chapman and N. C. Johnson. il Eng Rec 71:801-4 Je 26 '15

Report on Chinese concrete. Engineer 118:456+

N 13 '14; Abstract. Am Soc M E J 37:53 Ja '15

Selection of concrete materials, Ry Age 59: 516 S 17 '15

Stopping cracks in concrete, E. H. Seaman. Concrete Cem 7:76 Ag '15 Tests fail to show cause of retarded set of concrete. A. W. Hartman. Eng N 74:847 O

28 '15
Tests of frictional resistance of concrete on shale. E. L. Lasier. il diag Eng N 74:156-8
Jl 22 '15
Use of pudding stones in mass concrete. Concrete Cem 5:245-6 D '14
Sec also Asphalt; Bridges, Concrete; Cement; Concrete, Reinforced; Concrete construction and other headings beginning Concrete; Gunite; Pavements, Concrete; Roads, Concrete Concrete

Aggregate

Aggregate sizes to be kept in stock. Concrete Cem 7:117-19, 155-6 S-O '15

Burnt clay as concrete aggregate. W: W. Hay. il Eng & Contr 43:453 My 19 '15

Coal slack for concrete aggregate, R. B. Ket-chum. Eng N 73:540 Mr 18 '15

Concrete aggregate and sand in Kansas City: careful inspection necessary. Eng N 73:75 Ja 14 '15

Concrete materials tested in a Jones-Talbot rattler. Eng Rec 71:390 Mr 27 '15

Concrete—Aggregate—Continued
Crushed limestone aggregate for concrete pavements. A. M. Wolf. Eng N 74:902 N 4'15
Economic side of sand testing, C. M. Chapman and N. C. Johnson. il Eng Rec 71:734-7
Je 12'15; Same. Sibley J 30:65-70 N'15
Effects of metal-bearing aggregate on concrete. Concrete Cem 6:248-9 My'15
Field examination of concrete sand. diag Concrete Cem 6:303-5; 7:73-5 Je, Ag'15
Field examination of concrete sands. C. H. Fuller. Concrete Cem 7:156-7 O'15
Gravel aggregate for concrete. W. K. Hatt. il Munic Eng 49:2-8 Jl'15
Heating concrete aggregates, Concrete Cem 6:212-13 Ap'15
Importance of proper aggregates in concrete construction. M. D. Campbell. il Ry Age 58:329-30 F 19'15
Investigation to determine the relative resistance to wear of concrete made of different aggregates. C. F. Shoop. il Eng & Contr 44:144-7 Ag 25'15
Local sands and gravel as aggregates in concrete, F. M. McCullough. il Eng Soc W Pa 31:334-67 My'15; Same cond. Eng & Contr 44:194-6 S 8'15; Discussion. Eng Soc W Pa 31:368-79 My '15
Magnesium limestone as concrete aggregate. W. F. Healey. diags Concrete cem 5:257 D'14
Mechanical grading of concrete sand. G: P. Dieckmann. Concrete Cem 7:68-9 Ag'15

'14
Mechanical grading of concrete sand. G: P.
Dieckmann. Concrete Cem 7:68-9 Ag '15
Method of making mineralogical analysis of
sand. C. W. Tomlinson, Am Inst Min E Bul
101:947-56 My '15
Portable gravel screening and washing plant.
M. D. Campbell. plan Ry Age 59:345-6 Ag
20 1:5

M. D

Proportioning aggregates for Portland cement concrete. A. Moyer. Am Gas Light J 101: 214-15+ O 5 '14; Same. Eng & Contr 42:150-1 Ag 12 '14; Same cond. Eng Rec 70:37-8 J1 11 '14; Discussion. C. M. Chapman; W. M. Kinney. 70:38-9 J1 11 '14; Abstract. Concrete Cem 5:66-7 Ag '14
Safe concrete demands knowledge of nature of sands. C. M. Chapman and N. C. Johnson. il Eng Rec 71:771-4 Je 19 '15
Sand for concrete and cement mortar should have jump in grading. R. H. McNeilly. Eng Rec 72:659-62 N 27 '15
Screening and washing plants for supplying clean and well graded aggregate. il Concrete Cem 7:165-70 N '15

Specifications for concrete aggregates and re sults of field tests. R. E. Goodwin, Eng N 73:247-9 F 11 '15

State-wide survey locates road-making materials in New York, Eng Rec 71:488-9 Ap

esting aggregates for concrete roads built by the New York highway commission. H. S. Mattimore. Eng & Contr 43:294-6 Mr 31 '15; Same cond. Munic Eng 48:131-3 F '15; Excerpt (Sand for concrete pavements). Munic J 38:420-1 Ap 1 '15 Testing.

Testing concrete and aggregates—laboratory and field methods. R. E. Goodwin, il Con-crete Cem 7:179-82 N '15

Use and tests of unscreened gravel: Illinois state highway department. C. Older. il Eng N 72:1204-5 D 17'14

se of beach shells as concrete aggregate. Concrete Cem 7:72-3 Ag '15

Use of blast furnace slag as an aggregate in concrete. Concrete Cem 5:247-9; 6:210-11 D '14, Ap '15

Use of coke breeze as concrete aggregate. W: M. Kinney; A. M. Wolf. Concrete Cem 7:115-16 S '15

Use of hand, hammer crushed brick in concrete work. C. M. Wood. Concrete Cem 6: 160-1 Mr '15

se of six-inch and eight-inch aggregate points to economies in concrete work, E: O. Keator. Eng Rec 71:556-8 My 1 '15; Abstract. Eng M 49:595 Jl '15

Wearing tests for sand and gravel. F. 1 man. Good Roads n s 9:186-7 My 1 '15 L. Ro-See also Gravel; Sand

Colorina

Coloring a concrete wall with grout. Concrete Cem 7:116 S '15

Cost

Concrete cost computing chart. A. P. Hoover. Eng N 74:795-6 O 21 '15

Curina

Boiler capacity for steam curing. Concrete Cem 7:185-6 N '15

Cem 7:185-6 N '15
Influence of temperature on the strength of concrete. A. B. McDaniel. III U Eng Exp Sta Bul 81:1-24 '15; Abstracts. Eng N 74: 892 N 4 '15; Eng Rec 72:600-1 N 13 '15; Eng & Contr 44:405-8 N 24 '15; Am Soc M E J 37:726 D '15

Proper use of steam in curing concrete products. W: M. Kinney; E. L. Conwell. Concrete Cem 6:253-4 My '15
Shrinkage of concrete and conditions of curing, F. R. McMillan. Eng Rec 71:489-90 Ap

Exhibitions

Annual cement show at Chicago, il Bldg Age 37:59-63 Mr '15 37:59-63 Mr

Expansion

Expansion and contraction of concrete building measured. il Eng Rec 71:621 My 15 '15; Concrete Cem 6:219 Ap '15
Expansion in concrete sidewalks. Munic J 38:770-1 Je 3 '15
Expansion measurements on a concrete factory building. S. G. Koon. Eng N 73:408 F 25 '15

See also Concrete construction-Expansion ioints

Finishing

Finishing
Application of sulphate of zinc to concrete, preparatory to painting. W: M. Kinney. Concrete Cem 6:37-8 Ja '15
Bonding plaster coating to interior walls and ceilings. Concrete Cem 6:36-7 Ja '15
Bonds plaster to concrete and new concrete to old. il Eng Rec 72:213 Ag 14 '15
Cost, appearance and wearing qualities of various methods of surface finish for concrete. Eng & Contr 44:113-16 Ag 11 '15
Dustless concrete floors. il Eng Rec 70:607 D
5 '14

New facing material in many colors. Concrete Cem 7:160 O '15 Surface treatment of concrete bridges for railway and highway traffic. A. M. Wolf. il Concrete Cem 6:169-75 Ap '15

See also Concrete—Coloring; Concrete, Ornamental; Concrete stone

Freezing

Concrete freezing. Sci Am 111:482 D 5 '14 Concreting in freezing weather. J: Hammer-sley-Heenan. Eng M 48:743 F '15 Frostproofing admixture for concrete. Eng & Contr 43:112 F 3 '15

Frozen concrete responsible for building collapse at Saginaw, Mich. O: E. Eckert. il Eng Rec 71:271 F 27 '15

Integral salts for cold weather concreting. W: M. Kinney. Sci Am 112:249 Mr 13 '15

Painting

Application of sulphate of zinc to concrete, preparatory to painting. W: M. Kinney. Concrete Cem 6:37-8 Ja '15

Interior wall finishes and painting of concrete. W. R. Parker. Ry Age 57:1137-8 D 18 '14

See also Concrete-Coloring; Concrete-Protection

Permeability

Impermeability of Chem 6:1033 D '14 concrete. J Ind & Eng

Permeability tests on gravel concrete; with discussion, M. O. Withey, il W Soc E J 19: 813-58 N '14; Abstract with summary. Am Soc M E J 37:60-1 Ja '15; Summary. Ind Eng 14:411 O '14; Excerpts. Concrete Cem 6:296-7 Je '15

### Concrete -Continued

#### Protection

ymposium on the protection of concrete against alkali. Concrete Cem 6:89-90; 7:33 F, Jl '15 Symposium

Use of linseed oil to protect concrete from destruction by alkali. L. A. Waterbury; R. A. Hart. il Concrete Cem 6:90-3 F '15

See also Concrete-Painting; Concrete, Reinforced

#### Shrinkage

Shrinkage of concrete and conditions of curing, F. R. McMillan, Eng Rec 71:489-90 Ap 17 '15

#### Temperature

Temperature changes in mass concrete; abstracts. C. H. Paul and A. B. Mayhew. Eng N 74:923 N 11 '15; Eng Rec 72:624 N

Temperature changes in mass concrete found to be relatively small. Eng Rec 71:710 Je 5

See also Concrete, Effect of temperature on

#### Testing

Compressive strength of Portland cement mortars and concretes; abstract, R. J. Wig, G. M. Williams and E. R. Gates, J Fr Inst 180:608-13 N '15

180:608-13 N '15
Concrete briquettes subjected to cold weather tests. Eng Rec 71:275 F 27 '15
Concrete cut from actual structures stronger than field-sample specimens. R. E. Goodwin. Eng Rec 72:296-7 S 4 '15
Concrete field testing machine. diags Eng N 72:1269-70 D 24 '14
Concrete tests: outline of work in progress under direction of committee of American society for testing materials. Eng & Contr 44:28 JI 14 '15
Developments in concrete testing. Eng N 73:

Developments in concrete testing. Eng N 73:

225 F 4 '15 Effect of duration of mixing on the strength of concrete. H. H. Scofield. Eng & Contr 43: 78-9 Ja 27 '15

Experiments made to determine the effect of varying the percentage of water in concrete. R. K. Skelton. Eng & Contr 42:244-6 S 9

Field and laboratory tests of concrete. H. S. Mattimore. Eng N 73:232 F 4 '15 Field concrete better than test-sample con-

Mattimore. Eng N 73:232 F 4 '15 Field concrete better than test-sample concrete, R. E. Goodwin. Eng N 73:350 F 18 '15 Field testing machine used on Welland ship canal. il diags Eng Rec 72:112 J1 24 '15 Gravel aggregate for concrete, W. K. Hatt. il Munic Eng 49:2-8 J1 '15 Impermeability of concrete. J Ind & Eng Chem 6:1033 D '14 Influence of temperature on the strength of concrete. A. B. McDaniel. Ill U Eng Exp Sta Bul 81:1-24 '15; Abstracts. Eng N 74:892 N 4 '15; Eng Rec 72:600-1 N 13 '15; Eng & Contr 44:495-8 N 24 '15; Am Soc M E J 37:726 D '15 Investigation to determine the relative resistance to wear of concrete made of different aggregates. C. F. Shoop. il Eng & Contr 44:144-7 Ag 25 '15 Local sands and gravel as aggregates in concrete. F. M. McCullough. il Eng Soc W Pa 31:334-67 My '15; Same cond. Eng & Contr 44:194-6 S 8 '15; Discussion. Eng Soc W Pa 11:368-79 My '15

oil-mixed concrete found generally dampproof. L. W. Page. Eng Rec 72:334-5 S 11 '15 Permeability tests on gravel concrete; with discussion. M. O. Withey, il W Soc E J 19: 813-58 N '14; Abstract with summary. Am Soc M E J 37:60-1 Ja '15; Summary. Ind Eng 14:411 O '14; Excerpts. Concrete Cem 6: 296-7 Je '15 Report of committee of the American society for testing materials on standard tests of

Report of committee of the American society for testing materials on standard tests of concrete. Eng Rec 72:14 Jl 3 '15
Results of tests to determine the distribution of loads from concrete floor slabs to steel joists; abstracts. Eng & Contr 44:365-7 N 10 '15; Eng Rec 72:578-80 N 6 '15; Eng N 74:933 N 11 '15

Standard practice instructions for concrete testing laboratory, R. E. Goodwin, il Eng N 73:202-8 F 4 '15

Testing concrete and aggregates—laboratory and field methods. R. E. Goodwin. il Concrete Cem 7:179-82 N '15
Tests to determine temperature effects on strength of briquettes. Concrete Cem 7:183-

4 N 15 Tests to determine the effect of normal and low temperatures on the strength of cement mortar. Eng & Contr 43:196-7 Mr 3 '15 Why columns failed in Edison fire. W: E. Davis. Eng Rec 71:150 Ja 30 '15

See also Concrete, Reinforced—Testing; Floors, Concrete—Testing

## Waterproofing

#### See Waterproofing

# Concrete, Cinder

Cinder concrete floors. G. B. Waite, diags Eng & Contr 41:600-3 My 27 '14; Same cond. Ind Eng 14:302-4 Jl '14; Discussion, Eng & Contr 42:512-15 D 2 '14 Results of tests of cinder concrete floor slabs,

Results of tests of cinder concrete floor slabs, with conclusions and recommended methods of design. H. Perrine and G: E. Strehan. Eng & Contr 43:379-83 Ap 28 '15 Strength and other properties of typical cinder concrete used in floor construction in New York. H. Perrine and G: E. Strehan. Eng & Contr 43:301 Mr 31 '15 Testing cinder concrete floors. H. Perrine. Concrete Cem 6:25 Ja '15

## Concrete, Effect of alkalies on

oncrete, Effect of alkalies on the durability of cement drain tile in alkali soils. R. J. Wig and G. M. Williams. diags pls U S Bur Stand Tech Pa 44:1-56 '15; Abstract. J Fr Inst 179:354-6 Mr '15; Abstract. Eng Rec 72:220 Ag 21 '15; Excerpts. Concrete Cem 7:145-7 O '15

Investigation of the effects of alkali on concrete drain tile near Lake Park, Ia. C: E. Sims. Concrete Cem 6:278-81 Je '15 Symposium on the protection of concrete against alkali. Concrete Cem 6:89-90; 7:33 F,

Concrete, Effect of electricity on Electrolysis develops defects in but three out of 1500 concrete poles. H. G. Throop. Elec Ry J 45:294 F 6 '15

Concrete, Effect of lightning on Effect of lightning on concrete structures. Concrete Cem 7:187 N '15

Concrete, Effect of salts on Integral salts for cold weather concreting. W: M. Kinney. Sci Am 112:249 Mr 13 '15

Concrete, Effect of sea water on
Experiences with concrete in the republic of
Panama. A. P. Crary. il diags Eng N 73:21416 F 4 '15

Concrete, Effect of sewage on Effect of sewage and sewage a crete. Concrete Cem 7:31-2 Jl gases on con-

crete. Concrete Cem 7:31-2 Jl '15

Concrete, Effect of temperature on
Influence of temperature on the strength of
concrete, A. B. McDaniel. Ill U Eng Exp
Sta Bul 81:1-24 '15; Abstracts. Eng N 74:
892 N 4 '15; Eng Rec 72:600-1 N 13 '15;
Eng & Contr 44:405-8 N 24 '15; Am Soc M
E J 37:726 D '15

Temperature changes in mass concrete; abstracts. C. H. Paul and A. B. Mayhew.
Eng N 74:923 N 11 '15; Eng Rec 72:624 N
20 '15

Tests to determine temperature

Tests to determine temperature effects on strength of briquettes. Concrete Cem 7:183-

Concrete, Ornamental
Making the models and molds for ornamental
concrete work—using plaster and gelatin. il
Concrete Cem 6:150-1 Mr '15
Ornamental concrete entrance of Selig zoo,
Los Angeles. W. C. Sawyer, il Concrete Cem
7:99 S '15
Stone facing aggregates in colors Concrete

Stone facing aggregates in colors. Concrete Cem 7:159 O '15

# Concrete, Reinforced

Building concrete silos—monolithic construc-tion—types of commercial equipment. C. D. Gilbert, il diags Concrete Cem 7:58-62, 82-3 Ag

Concrete and reinforced concrete in 1914. S. E. Thompson. Eng Rec 71:11-13 Ja 2 '15

Concrete, Reinforced -Continued

Designing of reinforced — continued Designing of reinforced concrete slabs subjected to bending and compression. A. Bull. Eng & Contr 43:454-6 My 19 '15 Diagram facilitates estimating weight of steel in concrete. A. M. Wolf. Eng Rec 72:517-18

23

m concrete. A. M. Wolf. Eng Rec 72:517-18 O 23 '15

Draw diagrams for beams reinforced for compression. W. W. Clifford and C. H. Mangold. Eng Rec 72:472 O 16 '15

Early reinforced concrete in England. Concrete Cem 6:85 F '15

Electrolysis of reinforced concrete. Am Gas Light J 101:364 D 7 '14

Fabricated unit reinforcement. il Eng & Contr 44:153-4 Ag 25 '15

Features in the construction of new building for the Youth's companion, Boston. W. B. Conant. il diags Concrete Cem 7:133-5 O '15

How design and methods of buying influence the cost of steel reinforcing bars. A. D. Mellor. Concrete Cem 6:184-5 Ap '15

Large saving in steel effected by new system of flat-slab reinforcement; Youth's companion building, Boston. il plans Eng Rec 72:450-2 O 9 '15

Light frames support reinforcement for high retaining wall. il diag Eng Rec 72:56 Jl 10 '15

Mechanics of reinforced concrete under flexure in beam and slab types, C. A. P. Turner, Mechanics of reinforced concrete under flexure in beam and slab types. C. A. P. Turner. Boston Soc C E J 1:383-94 S '14; Discussion. 1:499-508; 2:23-47 N '14, Ja '15 Painting reinforcing material. Concrete Cem 5: 250-3 D '14 Reinforced concrete—design and construction. Concrete Cem 6:115-17 Mr '15 Reinforced-concrete footings economically de-signed N M Stiperman diag Eng Res 72:300

signed. N. M. Stineman. diag Eng Rec 72:300 S 4 '15

S 4 '15
Reinforced-concrete footings economically designed. W. A. Hoyt. Eng Rec 72:458 O 9 '15
Reinforced-concrete footings of special construction. diags Eng Rec 72:355-6 S 18 '15
Reinforcing concrete columns to carry additional stories. P. R. Prufert. il diag Eng N '74:410-11 Ag 26 '15
Reinforcing details of Delco building, Dayton, Ohio, diags Eng N '74:974-5 N 18 '15
Repair of defects in reinforced concrete. Eng N '74:233 Jl 29 '15
Shop assembled reinforcement. Concrete Cem.

assembled reinforcement. Concrete Cem

Special methods of reinforced concrete design; with discussion, M. J. Lorente, diags Boston Soc C E J 2:265-82 S '15

Steel reinforcement promises much in development. A. Brett, Concrete Cem 7:120 S '15 Time-saving in placing reinforcing, il Concrete Cem 7:128 S '15

Torsion strength of reinforced concrete beams.

Am Soc M E J 37:49-50 Ja '15

See also Concrete; Concrete construction

### Testing

Concrete column tests disclose effects of longi-

concrete column tests disclose effects of longitudinal and spiral reinforcement, diags Eng Rec 71:527-9 Ap 24 '15
Designing of reinforced concrete beams; some data tending to show errors in present theory and practice. L. J. Mensch. Eng & Contr 44:108-11 Ag 11 '15
Fifty-ton testing machine built in college shop. C. C. Myers, il diag Eng N 74:1050-1 N 25 '15

aints to prevent electrolysis in concrete structures. H: A. Gardner, il J Fr Inst 179: 318-36 Mr '15; Same. J Ind & Eng Chem 7:504-10 Je '15; Same cond. Iron Tr R 57: 139-40+ Jl 15 '15; Abstracts. Eng N 73:136-7 Ja 21 '15; Eng Rec 71:465-6 Ap 10 '15; Am Soc M E J 37:297 My '15; Concrete Cem 6:310 Je '15

Shrinkage and time effects in reinforced concrete, F. R. McMillan, il Minn U Bul 3:1-41 '15; Abstracts, Eng N 73:502-3 Mr 11 '15; Eng Rec 72:251-2 Ag 28 '15; Eng & Contr 44: 306-10 O 20 '15

Tests of circular and egg-shaped reinforced concrete sewer pipe. A. T. Goldbeck. il diags Eng & Contr 43:307-9 Ap 7 '15; Same (Reinforced-concrete sewer pipe tested for stiffness and impermeability). Eng Rec 71: 711-12 Je 5 '15

Tests of some large reinforced concrete culvert pipe. W. J. Schlick, il diag Concrete Cem 6:78-80 F '15
Tests on the shearing resistance of reinforced concrete beams; abstract. E. Brown, H. M. MacKay and C. M. Morssen. Am Soc M E J 37:724 D '15

Concrete atomizer ining two 5-ft. tunnels by use of concrete atomizer, il Eng N 74:938-9 N 11 '15 Lining

Concrete barges, See Barges, Concrete

Concrete benches, See Benches, Concrete

Concrete blocks

Building a sewer tunnel of special concrete blocks reinforced, diags Eng N 74:127-8 JI

15 '15
Building code regulation of concrete block and other building units. H. Whipple. Concrete Cem 6:181-4 Ap '15
Building concrete silos—unit construction with blocks and staves; with cost tables. C. D. Gilbert. il diags Concrete Cem 7:3-6, 37-8 .T1

Concrete block used in attractive and econom-

Concrete block used in attractive and economical house construction at Mooseheart, Ill. il plans Concrete Cem 6:15-16 Ja '15
Concrete blocks cover sewage filter underdrains. il Eng Rec 71:333 Mr J3 '15
Construction plant and methods employed in building a system of concrete block tunnel sewers at Edmonton, Alberta, diags Eng & Contr 43:361-3 Ap 21 '15
Good practice in concrete block house construction. Concrete Cem 6:305-8 Je '15
Handling 62-ton concrete blocks at Halifax. il Eng N 74:368 Ag 19 '15
Manufacture of hollow concrete block in the Canal Zone—the administration building. il Concrete Cem 6:176-80 Ap '15
Regulation of concrete block manufacture and

Regulation of concrete block manufacture and use. Concrete Cem 6:208-9 Ap '15 Toronto breakwater to curb 10-foot waves. diags Eng Rec 70:694-6 D 26 '14

See also Concrete bricks

Concrete bricks

concrete bricks
Equipment of a concrete brick plant in hospital broom shop. H. E. Jenks, il plan Concrete Cem 6:193-5 Ap '15
Preliminary work in brick manufacture by patients in Norfolk state hospital, H. N. Jenks. il Concrete Cem 6:136-7 Mr '15

Concrete bridges. See Bridges, Concrete Concrete chimneys. See Chimneys, Concrete

Concrete coating Coating disinte Coating disintegrated stone abutments with concrete il Eng Rec 71:337-8 Mr 13 '15 Concrete incasement of steel bridge girders, diags Eng N 73:1082 Je 3 '15 Protection of metal structures, F: H, Fay, il diags Eng Soc W Pa 31:132-66 Mr '15

Concrete columns. See Columns, Concrete

#### Concrete construction

oncrete construction

American concrete institute: convention, Eng
N 73:360-1 F 18 '15

American concrete institute's tests on concrete columns. Eng N 73:524-7 Mr 18 '15

Baltimore filters abound in useful hints on concrete construction and design. J. W. Armstrong, il plans Eng Rec 71:583-6 My 8 '15

'15
Building concrete drops on irrigation canals in western Canada. R. S. Stockton. il Concrete Cem 6:236-8 My '15
Building the Tough-Oakes mill. J; A. Baker. il diags Eng & Min J 100:369-74 N 27 '15
Concrete: a medium of aesthetic expression. I. K. Pond. Concrete Cem 6:119-20 Mr '15
Concrete and reinforced concrete in 1914. S. E. Thompson. Eng Rec 71:11-13 Ja 2 '15
Concrete buildings in Mexico. Bldg Age 37: 29-30 F '15
Concrete construction on the New York state

Concrete construction on the New York state barge canal. G: C. Mills. il diags Concrete Cem 6:205-7 Ap '15 Concrete mantel made with pre-cast units. il diags Concrete Cem 6:138 Mr '15 Concrete mixing and placing, Ford building, Buffalo. il plan Eng N 74:1083-4 D 2 '15 Concrete rings, superimposed, sunk to form San Antonio pump pit. W: W. Hay. il diag Eng Rec 71:741-2 Je 12 '15

Concrete construction -Continued

Concrete units for crib construction at Cedars Rapids. il diags Eng N 73:675-7 Ap 8 '15 Concrete units for crib construction. M. D. Campbell. il Ry Age 58:476-7 Mr 12 '15 Concrete warehouse on Brooklyn waterfront rapidly completed. T. A. Smith. il Eng Rec 71:98-9 Mr 6 '15

71:298-9 Mr 6 '15 Concrete work on the Arizona division of the Santa Fe. il diags Ry Age 58:849-52 Ap 16

Concrete work withstands severe tests in the Eric flood, L. R. Ferguson, il Concrete Cem 7:148-50 O '15

Constructing the Austin Nichols building in New York, il diags Eng & Contr 43:296-9 Mr 31 115

31 '15
Construction details of bridge across Portland harbor, il diag Eng N 74:865-8 N 4 '15
Construction management. S. E. Thompson and W: O. Lichtner, il diags W Soc E J 20: 109-29 F '15; Same cond. Eng & Contr 43: 428-32 My 12 '15; Discussion. W Soc E J 20: 129-51 F '15
Construction of sanitary mangers in dairy

Construction of sanitary mangers in dairy barn at Troy, Pa. il diags Concrete Cem 6: 104-6 F '15

104-6 F '15
Design and construction of Massachusetts institute of technology buildings. S. E.
Thompson. il diags plan Concrete Cem 7:14-19 Jl '15; Same. Eng & Contr 43:513-18 Je
9 '15; Same cond. Eng Rec 71:748-50 Je 12 '15
Design and construction of Midland ware-

Design and construction of Midland warehouse, Chicago, il diags plans Eng & Contr 44:182-4 S 8 '15

Design and construction of the Chicago Hebrew institute, il plans Eng & Contr 43:558-63 Je 23 '15

Design and construction of the Gantner-Mattern co. knitting mill at San Francisco. E. F. Cykler, il diags Concrete Cem 6:273-7

Je '15

Design features of reinforced constructions.

Design features of reinforced concrete swim-ming pool at Riverview park, Chicago, plan Eng & Contr 44:357 N 3 '15 Details of a standard portable carpenter shop

on construction work, il plans Concrete Cem

on construction work il plans Concrete Cem 6:186 Ap '15
Edge protector for concrete structures. Munic Eng 48:374-5 Je '15
Erecting small concrete buildings. P. H. Wilson. il diag Bldg Age 37:37-8 Je '15
Expansion and contraction of concrete building measured. il Eng Rec 71:621 My 15 '15; Concrete Cem 6:219 Ap '15
Expansion measurements on a concrete factory building. S. G. Koon. Eng N 73:408 F 25 '15

tory b

Features in the construction of new building for the Youth's companion, Boston, W. B. Conant. il diags Concrete Cem 7:133-5 O '15

ield methods in concrete construction. J. Cochran. Concrete Cem 6:31-2, 81-3, 142-4, 187-9, 285-9+; 7:23-6, 107-10, 175-8 Ja-Ap, Je-Jl, S, N '15

Field problems in concrete construction. Concrete Cem 6:121-2 Mr '15 First reinforced concrete arch in America. J. W. Pearl, diag Concrete Cem 7:75-6 Ag 15

Five examples of cantilevered auditorium bal-conies. diags Eng Rec 72:234-5 Ag 21 '15 Foundations for transmission line, and tower erection; Toronto power company. F. C. Connery. il diags Am Inst E E Pro 34:1369-

foundations for transmission line towers and tower erection. P. M. Downing, pls Am Inst E E Pro 34:1193-7 Je '15; Abstract, Elec W 66:10 Jl 3 '15

Foundations for transmission line towers and towers are transmission line towers and the secondary soundations.

roundations for transmission line towers and tower erection; concreting foundations. J. A. Walls. pls Am Inst E E Pro 34:1167-78 Je '15; Abstract. Elec W 66:8-9 Jl 3 '15 Galveston's sea-wall checks hurricane's devastation. E. B. Van de Greyn. il diags Eng Rec 72:271-5 Ag 28 '15

Good practice in concrete block house con-struction. Concrete Cem 6:305-8 Je '15

Hoist for reinforcing-steel. H. DaCamara. diag Eng N 73:395 F 25 '15
Hydrostatic catenary flume on a concrete aqueduct. H. B. Muckleston. il diags map Eng N 74:58-63 Jl 8 '15

Large reinforced-concrete cribs used for Welland ship canal entrance. R. P. Johnson. il diags Eng Rec 71:458-60 Ap 10 '15 Large saving in steel effected by new system of flat-slab reinforcement; Youth's com-

of flat-slab reinforcement; Youth's companion building, Boston. il plans Eng Rec 72:450-2 O 9 '15

72:450-2 O 9 '15
Longest municipal pier in United States is nearing completion at Chicago. il diags Eng Rec 71:778-80 Je 19 '15
Manufacture of hollow concrete block in the Canal Zone—the administration building. il Concrete Cem 6:176-80 Ap '15
Mappin terraces at the Zoo. R. N. Stroyer. il diags Engineer 119:156-7 F 12 '15
Mechanics of virious description description of the concrete under th

il diags Engineer 119:156-7 F 12 '15
Mechanics of reinforced concrete under flexure in beam and slab types. C. A. P. Turner.
Boston Soc C E J 1:383-94 S '14; Discussion. 1:499-508; 2:23-47 N '14, Ja '15
Method and cost of constructing reinforced concrete drops, Canadian Pacific Ry., irrigation projects. R. S. Stockton. il Eng & Contradistriation projects. R. S. Stockton. il Contradistriation projects. R. S. Stockton. il Eng & Contradistriation projects. R. S. Stockton. il Gags Concrete Sewer. E. W. Robinson. il diags Concrete Cem 7:93-6 S '15

Methods and costs of constructing the Bay st.

Methods and costs of constructing the Bay st. underpass at Macon, Ga. C. H. Fuller. il diags Concrete Cem 6:75-8 F '15
Mixture of mortar for laying up block walls. Concrete Cem 6:39 Ja '15
National league baseball park of reinforced concrete at Boston. W. B. Conant. il diags Concrete Cem 7:53-5 Ag '15
New concrete construction processes and appliances. Eng & Contr 43:113 F 10 '15
New deep water pier at Halifax, Nova Scotia. A. F. Dyer. il Concrete Cem 7:7-13 Jl '15; Same cond. Eng N 73:1204-10 Je 24 '15
New graving dock at South Shields. il diag plan Engineer 120:154-6, 158 Ag 13 '15
New York rapid transit railway extensions. F. Lavis. il diags Eng N 72:1294-8 D 31 '14
Palmer memorial stadium at Princeton university. il diags plan Eng N 72:1184-7 D 10 '14

Portable buildings of monolithic reinforced concrete. il Eng N 72:1255 D 24 '14 Portland viaduct. W. B. Conant. il diags Munic J 39:499-502 S 30 '15

Preliminary repair work on the Edison concrete buildings. il diags Eng N 73:89-91 Ja 14 '15

Reinforced concrete as an emergency repair for an iron chimney, il diag Eng & Contr 43: 100-1 F 3 '15

Reinforced-concrete cap of Perry memorial column. H. C. Baird. diags Eng N 74:154-5 Jl 22 '15

column. H. C. Baird. diags Eng N 74:154-5 Jl 22 '15
Reinforced concrete—design and construction. Concrete Cem 6:115-17 Mr '15
Reinforced concrete factory buildings; abstracts. F. W. Dean. Am Soc M E J 37:9
Ja '15; Iron Tr R 56:518+ Mr 11 '15; Discussion. Am Soc M E J 37:9-11 Ja '15
Reinforced-concrete floating caissons for the Welland ship canal. il diags Eng N 73:1122-4 Je 10 '15

Reinforced-concrete frame of hotel Traymore erected at rate of a floor a week. il plans Eng Rec 72:50-1 Jl 10 '15 Repair of concrete buildings at Edison plant

Repair of concrete buildings at Edison plant sets precedents in construction work, il diags Eng Rec 71:503-6 Ap 17 '15
Restoring concrete buildings at Edison plant, diags Eng Rec 71:40 Ja 9 '15
San Diego's municipal stadium. F. A. Rhodes, il plan Eng N 74:577-80 S 23 '15
Sheepshead Bay two-mile speedway scientifically designed for high velocities, il diags Eng Rec 71:739-40 Je 12 '15
Steel concreting tower with slotted boltholes designed for rapid erection, diag Concrete Cem 5:269-70 D '14
Storage cellar built of concrete P. H. Wil-

Storage cellar built of concrete, P. H. Wilson, il Bldg Age 37:64 Mr '15 Structural features of a reinforced concrete combined storage warehouse and office building in Seattle, diags Eng & Contr 42: 446-51 N 11 '14 Concrete construction -Continued

System of unit construction, il Concrete Cem 7:160-1 O '15

Tall reinforced concrete coke house in Rotter-dam, Holland. il Eng & Contr 44:229-30 S 22 '15

22 '15
Temperature measurements in concrete buildings. Concrete Cem 6:155-7 Mr '15
200,000 yards of concrete placed for \$800,000
in Lake Washington canal lock, il diag plan
map Eng Rec 72:141-3 Jl 31 '15
U-bolt splice in heavy reinforcing bars. T: C.
Atwood. diags Eng N 73:218 F 4 '15
Unit construction of a Portland cement mill
building. D. C. Findlay. il diags Concrete
Cem 7:79-81 Ag '15
Unit construction reduces quantity of concrete. J. E. Conzelman. il Eng Rec 72:635-6
N 20 '15
Uses for concrete construction by cotton

Uses for

ses for concrete construction by cotton manufacturers. L. C. Wason. Textile World 49:288-91 My '15

See also Bridges, Concrete; Chimneys, Concrete; Columns, Concrete; Concrete, Reinforced; Concrete blocks; Concrete finishing; Concrete houses; Concrete lining; Concrete placing; Concrete slabs; Concrete stone; Concrete houses; Concrete lining; Concrete placing; Concrete slabs; Concrete stone; Dams, Concrete; Fireproof construction; Floors, Concrete; Lighthouses, Concrete; Poles, Concrete; Pontsons, Concrete; Reservoirs, Concrete; Retaining walls, Concrete; Roofs, Concrete; Sewers, Concrete; Silos, Concrete; Stranger, Concrete; Str Roofs, Concrete; Retaining wans, Contrete, Roofs, Concrete; Stevens, Concrete; Silos, Concrete; Stairways, Concrete; Standpipes, Concrete; Tanks, Concrete; Trestles, Concrete; Walls, Concrete; Water towers, Concrete; Walls, Concrete; Water towers, Concrete; Walls, Concrete; Water towers, Concrete; Water towers, Concrete; Walls, Concrete; Water towers, Concrete; Wa

Building concrete silos—unit construction with blocks and staves; with cost tables. C. D. Gilbert. il diags Concrete Cem 7:3-6, 37-8

Cost of mill construction. H. T. Curran. Eng & Min J 100:345-7 Ag 28 '15; Same. Eng & Contr 44:266-8 O 6 '15 Material cost of concrete slabs. Concrete Cem 7:182 N '15

## Design

Chart for designing reinforced concrete beams.
R. R. Leffler. Eng & Contr 42:135-8 Ag 5

municipal pier. il diags Eng N 74:

Chicago municipal pier. il diags Eng N 74: 193-7 JI 29 '15
Design and construction features of the Palmer memorial stadium, Princeton, N. J. il diags plan Eng & Contr 43:472-5 My 26 '15
Design and construction of a unit-cast mill building in Victoria, B. C. il diag plans Eng & Contr 44:185-6 S 8 '15
Design methods in concrete construction J. Cochran. Concrete Cem 6:33-4, 83-5, 145-8, 190-2, 282-4 Ja-Ap, Je '15
Design methods in concrete construction—arches with fixed ends. A. M. Wolf, diags Concrete Cem 7:137-44 O '15
Design methods in concrete construction—retaining walls. S. M. Cotten. diags Concrete Cem 7:63-7 Ag '15
Design of rectangular concrete beams. H.

Design of rectangular concrete beams. H. Harding. Am Soc M E J 37:529-31 S '15
Design of reinforced concrete buildings. A. C. Janni; A. M. Wolf; L. R. Viterbo. Concrete Cem 7:70-2 Ag '15
Design of reinforced concrete buildings. J. A. Currey; E: Godfrey. Concrete Cem 5:249-50
Design of reinforced concrete Cem 5:249-50

Design of reinforced concrete T-beams and rectangular beams with steel in compression. M. J. Lorente. Eng & Contr 43:182-4 F 24 '15

Designing of reinforced concrete beams; some data tending to show errors in present theory and practice. L. J. Mensch. Eng & Contr 44:108-11 Ag 11 '15

Details of the reinforced concrete building of the Ford motor co., Chicago, Ill. il diags Eng & Contr 42:220-2 S 2 '14

Economy in the design of reinforced concrete columns. P. J. Waldram. Engineer 120:28-30, 52-4 Jl 9-16 '15

Expansion joints over beams and girders, J: T. Simpson; A. M. Wolf, Concrete Cem 6:93 F

Graphical method for designing simple re-inforced concrete beams and data for de-signing simple, double-reinforced and T-beams. R. R. Leffler. Eng & Contr 43:239-42 Mr 17 '15 Largest fireproof resort hotel in the world

Mr 17 '15. Lenter. Eng & Contr 43:239-42
Largest fireproof resort hotel in the world completed at Atlantic City. il diags Eng Rec 72:11-13 Jl 3 '15
Maximum stresses in tension reinforcement.
M. J. Lorente. Eng & Contr 42:366 O 14 '14
National league ball park at Boston. il diags Eng N 74:374-7 Ag 19 '15
New ruling on reinforced concrete flat slab construction by building department of Chicago. Eng & Contr 42:330 O 7 '14
New steel and concrete structure to furnish nearly sixteen acres of floor space; Bingham warehouse in Cleveland, diags plan Eng Rec 72:356-7 S 18 '15
New Traymore hotel at Atlantic City. il diags Eng N 74:18-23 Jl 1 '15
Reinforced concrete and brick roundhouse of the Buffalo, Rochester & Pittsburgh Ry., at Dubois, Pa. diags plans Eng & Contr 44: 66-9 Jl 28 '15
Reinforced-concrete footings economically

footings designed. N N. M. Stineman. diag Eng Rec 72:

300 S 4 '15 Reinforced-concrete footings of special con-struction. diags Eng Rec 72:355-6 S 18 '15 Reinforced-concrete roundhouse at Du Bois. il diags Eng Rec 71:167-9 F 6 '15 Shipping piers in Southwark district of Phila-delphia. il diags plans Eng N 74:421-4 Ag 26

Simple method of determining the stresses in concrete arches due to temperature and rib shortening. H. R. Thayer. Eng & Contr 44:173-4 S 1 '15 Special details in reinforced concrete and steel building construction. L: W. Bruck. Eng & Contr 44:143-4 Ag 25 '15 Special methods of reinforced concrete design; with discussion. M. J. Lorente. diags Boston Soc C E J 2:265-82 S'15 Structural features of the Field museum of natural history, Chicago. diags plan Eng & Contr 44:226-7 S 22 '15 Suspended beam forms—their advantages and disadvantages. S. Diamant. diag Eng Rec 71: 120 Ja 23 '15

120 Ja 23 '15 Unit-built concrete umbrella sheds. Los Angeles, California. R. R. Newman. il diags Concrete Cem 7:20-2 Jl '15 Wall beam details in reinforced concrete build-ing. Concrete Cem 6:88 F '15

See also Floors, Concrete

## Expansion joints

Expansion joints in concrete structures. diags Ry R 57:628-30 N 13 '15; Abstract. Eng Rec 72:532 O 30 '15

Expansion joints over beams and girders. J: T. Simpson; A. M. Wolf. Concrete Cem 6:93 F

Perishable dividing plate for expansion joints in concrete. Munic Eng 48:324+ My '15

#### Failures

Bridge sidewalk failure due to paving expansion, Dallas, Texas. il diag Eng N 73:92 Ja , 15

14 '15
Contractors to replace \$20,000 worth of concrete bridge work. J. H. Ames. il Concrete Cem 7:104-6 S '15
Control of reinforced concrete construction. W. K. Hatt. Concrete Cem 6:297-8 Je '15
Failure of 17-year-old concrete roof slab. Eng N 74:92-3 Jl 8 '15
Failure of the Hippodrome arcade, Youngstown, Ohio. diags plan Eng N 72:1326-30 D 23' '14

town,

ailure of the theater and Arcade building, Youngstown, Ohio. E: Godfrey. il Eng & Contr 42:515-16 D 2 '14 Failure

Frozen concrete responsible for building collapse at Saginaw, Mich. O: E. Eckert. if Eng Rec 71:271 F 27 '15

# Fire resistance

ehavior of reinforced concrete in fires. il Eng Rec 70:635-6 D 12 '14 Behavior

Concrete as fire-resisting material, T: A, Edison. Eng Rec 71:598 My 8 '15

Concrete construction-Fire resistance-Cont

Concrete construction—Fire resistance—Cont.
Concrete construction and the Edison fire.
L. C. Wason. Textile World 48:537-40 F '15
Concrete was melted in Edison fire. il Eng N
73:362-3 F 18 '15
Disastrus five of Edison for

Disastrous fire at Edison factory, il plan Eng Rec 70:660-2 D 19 '14 Fire protection of structural members, S.

Fire protection of structural members. S. Broadbent. Concrete Cem 6:124 Mr '15 Fire-resisting qualities of concrete. W: M. Kinney. Concrete Cem 6:40 Ja '15 Hot chemicals and concrete formed slag at Edison fire. Eng Rec 71:184 F 6 '15 Preliminary report of committee on Edison fire, diags plan Eng & Contr 43:193-6 Mr 2 '15

3 '15
Preliminary report of committee on Edison
fire; findings. Eng & Contr 43:145 F 17 '15;
Same. Concrete Cem 6:120-1 Mr '15
Underwriters and fire protection association
report on Edison fire. il diag plan Eng Rec
71:239-42 F 20 '15

## Forms

Concrete form appliances that will interest contractors, il Eng Rec 72:32 J1 3 '15 Design, construction and detailed costs of the sliding forms for a reinforced concrete grain storage house. W: W. Hay. Eng & Contraction of the contraction of storage house. V 44:304-5 O 20 '15

Field methods in concrete construction-beam

and slab forms. J. Cochran. diags Concrete Cem 6:285-8+ Je '15 ield methods in concrete construction—cleaning and lubrication of forms and centering. J. Cochran. Concrete Cem 7:175-8 N

Field methods in concrete construction—col-umn forms; design and construction. J. Cochran, Concrete Cem 6:187-9 Ap '15

Field methods in concrete construction—design and construction of forms in general, J. Cochran. Concrete Cem 6:142-4 Mr '15
Field methods in concrete construction—wall

forms: design and construction, J. Cochran. Concrete Cem 7:23-6 Jl '15 (at system lowers cost of concrete forms and strengthens structure. il Eng Rec 72:679 N

27 '15

New system of adjustable concrete floor forms, il diags Concrete Cem 6:269-70 My '15

Saving time in setting forms, il Concrete Cem 7:103 S '15

Special features in forms for concrete buildings, il diags Eng N 73:730 Ap 15 '15

Standard designs for concrete form work; drawings, Concrete Cem 7:57 Ag '15

Unit steel forms for concrete walls and floors, il Concrete Cem 7:126 S '15

Whalen culvert form, il Munic J 39:376-7 S 2 '15

Concrete construction in mines
Concrete in mine work, S. Reynolds. Colliery
35:407-8 Mr '15
Concrete underground ore pocket at Copper
Queen. F. M. Heidelberg, diags Eng & Min
J 100:559-61 O 2 '15

J 100:539-01 U 2 15 Reinforced concrete props and beams in mines. S. M. Dixon. Colliery 35:431-2 Mr '15 Use of concrete underground; methods in use in some shafts in the copper country. H. T. Mercer. diags Colliery 35:419-26 Mr '15

Mercer. diags Colliery 35:419-26 Mr '15

Concrete construction in winter
Casting concrete pipe out of doors in winter
at Hamilton, Ontario. A. F. Macallum. il
Concrete Cem 7:174 N '15

Cold weather construction methods used in
erecting Hotel Traymore. D. L. Kneedler, il
diags Concrete Cem 7:172-4 N '15

Concrete construction in the winter: heating
the water, sand and gravel by steam and the
enclosed work by stoves, salamanders, etc.
H. H. Rice. il Bldg Age 37:34-6 F '15

Concrete in cold weather. L. C. Wason. Concrete Cem 6:94 F '15

Concrete road building in cold weather re-

Concrete road building in cold weather requires precautions. Eng Rec 72:641-2 I quires precautions. 20 '15

Concreting in freezing weather. J: Hammer-sley-Heenan. Eng M 48:743 F '15 Cost of mill construction. H. T. Curran. Eng & Min J 100:345-7 Ag 28 '15; Same. Eng & Contr 44:266-8 O 6 '15

Cost of winter construction. H. C. Campbell. Eng & Min J 100:565 O 2 '15
Cost of winter construction. H. T. Curran. Eng & Min J 100:889-90 N 27 '15
Effect of frost upon concrete. J: Hammersley-Heenan. Colliery 36:18 Ag '15
Features of a large winter concreting job. il plan Eng N 73:538-40 Mr 18 '15
Method of constructing concrete road in freezing weather. H. C. Campbell. il Eng & Contr 44:348 N 3 '15
New coal dock for the Cincinnati, Hamilton & Dayton at Toledo. il plan Ry Age 59:273-4 Ag 13 '15; Same. Ry R 57:236-9 Ag 21 '15; Same cond. Eng Rec 72:163-4 Ag 7 '15
Paper-covered frames for cold weather concreting. A. A. Lane. il Eng Rec 71:59 Ja 9 '15

Precautions s necessary to assure successful work in winter. Concrete Cem 7: concrete w 171-2 N '15

Report on national frost-proofing, Concr Cem 7:190-1 N '15 Tests to determine temperature effects national frost-proofing. Concrete

strength of briquettes. Concrete Cem 7:183-

Toledo coal dock built in record time, il plan Eng N 74:520-2 S 9 '15 Warning against cold weather concreting, H. A. Rands, Eng N 73:548-9 Mr 18 '15

See also Concrete-Freezing

Concrete curbs. See Curbs, Concrete Concrete dams. See Dams, Concrete Concrete drain tile. See Drain tile

Concrete failures. See Concrete construction-Failures

Concrete floors, See Floors, Concrete Concrete handling

oncrete handling
Aggregate mechanically handled from pit toroad, il Eng Rec 72:133-4 Jl 31 '15
Concrete plant used on the Austin-Nichols
building at Brooklyn, N. Y. T. A. Smith. il
plans Concrete Cem 6:261-3 My '15
Concrete warehouse on Brooklyn waterfront
rapidly completed despite serious delays.
T. A. Smith. il Eng Rec 71:298-9 Mr 6 '15
Inexpensive bucket and hoist for concrete
handling. E. H. Owen. il diag Concrete Cem
6:257-8 My '15
Large quick-dumping concrete car used at
46th street pier. il Eng Rec 72:395 S 25 '15
Telpher charges concrete mixer direct from
cars. diags Eng Rec 71:408-9 Mr 27 '15
Titting hopper saves labor on concrete job.
G: W. Davidson. il Eng Rec 72:459-60 0 9 '15
Wet concrete hauled from central plant on
river. il Eng Rec 71:469-70 Ap 10 '15
concrete houses

Concrete houses Concrete block house, with double wall, which cost less than \$2,500. il plans Concrete Cem 6:44-5 Ja

6:44-5 Ja '15
Concrete block used in attractive and economical house construction at Mooseheart, Ill. il plans Concrete Cem 6:15-16 Ja '15
Concrete house with double walls. il plans Bldg Age 37:63-6 F '15
Construction of small concrete houses at San Juan, P. R. E. K. Burton. il diags Concrete Cem 7:100-3 S '15
Cost and construction datails of double walls

Cost and construction details of double wall

on L house or 48-9 Ja Long Island. il Concrete Cem 6:

house on Long Island. il Concrete Cem 6: 48-9 Ja '15
Country house built of concrete. il diags plans Bldg Age 37:42-4 F '15
Double-wall house construction with pre-cast wall, floor and roof units. il Concrete Cem 6:26-8 Ja '15
Engineer's concrete block cottage—built in Riverside, Cal., for \$3,000. R. R. Newman. il plans Concrete Cem 6:20-1 Ja '15
House with concrete walls and permanent interior form of hollow tile. C. R. Knapp. il diags plans Concrete Cem 6:22-3 Ja '15
Houses at Forest Hills Gardens—pre-cast hollow concrete floor, wall and roof units and exposed aggregates. F: Squires. il Concrete Cem 6:2-8, 53-4 Ja '15
Prize design in English farm cottage competition. il Concrete Cem 6:218-19 Ap '15
Six-room house, double concrete walls, costs complete, \$3,500. il plans Concrete Cem 6:47-8 Ja '15

Concrete houses -Continued

Steel and concrete mine houses. diags plan Eng & Min J 99:987-8 Je 5 '15 Two-story house with walls and floors of con-crete, built for less than \$3,000. il Concrete Cem 6:50-2 Ja '15

Worked out details in concrete house construction. A. M. Smith, diags Concrete Cem 6: 17-18 Ja '15

See also Concrete—Painti struction; Floors, Concrete -Painting: Concrete con-

Concrete institute, American. See American concrete institute

Concrete lining

oncrete lining
Building invert of Milwaukee intake tunnel.
L. G. Warren. diags Eng N 74:8\*2-3 N 4 '15
City tunnel of the Catskill aqueduct. W. E.
Spear. Eng N 73:194-9 F 4 '15
Concrete as a furnace lining. J. C. Hawkins.
Power 41:169-70 F 2 '15
Concrete-lined oil storage reservoirs in Cali-

Concrete-lined oil storage reservoirs in California; construction methods and cost data; abstract. E. D. Cole. diag Eng & Contr 44: 408-9 N 24 '15 Concrete lining as applied to irrigation canals. S: Fortier. 17 pls U S Agric Bul 126:1-86 '14; Excerpt (Design and structural details). Eng & Contr 43:71-4 Ja 27 '15; Excerpt (Methods and costs of constructing). Eng & Contr 43:30-6 F 10 '15 Concrete lining for irrigation canals at Burbank, Wash.; abstracts. E: M. Chandler. Eng N 73:772-3 Ap 22 '15; Eng & Contr 43:489-90 Je 2 '15 Concrete lining for steel bunkers. il Power 40:

Concrete lining for steel bunkers. il Power 40:

Concrete lining for steel bunkers, it Power 40: 812 D 8 '14
Concrete lining improves sewage-laden creek, J. D. Justin, il Eng Rec 72:101-2 Jl 24 '15
Construction of the Eden Park reservoir, Cincinnati, K. C. Crain, il Concrete Cem 6:134-5 Mr '15

Driving and lining carried on simultaneously

b Mr '15
Driving and lining carried on simultaneously at Snoqualmie tunnel saved timbering. R. W. Rae. diags Eng Rec 72:44-6 Jl 10 '15
Ferro-concrete shaft linings. M. Gillieaux. diags Colliery 35:609-11 Je '15
Harlem river four-track subway tunnel. O. Hoff. il diags map Eng Soc W Pa 31:517-37; Discussion. 31:571-83 O '15
Lining a double track railway tunnel under traffic. R. Meacham. il diag Ry Age 59:966-8 N 19 '15; Same. Ry R 57:645-8 N 20 '15; Same. Eng & Contr 44:395-6 N 17 '15
Lining a railway tunnel by compressed air. il Eng N 74:1033 N 25 '15
Lining the St. Louis water tunnel with concrete by means of compressed air. E. C. Davis. il Eng N 73:164-6 Ja 28 '15; Same. Assn Eng Soc J 53:287-93 D '14
Lining tunnels on the new Lewistown-Great Falls line of the St. Paul. diag Ry Age 58: 978-9 My 7 '15
Modern methods in railway tunnel construction. C: S. Churchill. diags Ry R 57:547-55
Modifications in shaft design influenced by a concertion of high paratorial Eng & Contr

O 30 '15

Modifications in shaft design influenced by concrete as a lining material. Eng & Contr 43:370 Ap 28 '15

Placing a concrete lining in the Sandy Ridge tunnel. il plan Ry Age 59:533-6 S 17 '15; Same. Ry R 57:327-32 S 11 '15; Same (Self-propelled compressed-air mixing plant) Eng Rec 72:353-5 S 18 '15

Placing the concrete lining for reservoirs. Eng N 74:267-8 Ag 5 '15

Plaster lining irrigation canals and laterals, Okanogan project, U. S. reclamation service. C. Casteel. Eng & Contr 43:441-3 My 19 '15

Records of operation in handling concrete with compressed air, il diag Concrete Cem 5:260-3

compressed air. il diag Concrete Cem 5:260-3

Records of seepage losses in concrete lined canals. H. D. Newell. Eng & Contr 44:22 Jl of West discloses best practice in Tour

gation and power canal design. C. A. Farwell. Eng Rec 71:623-4 My 15 '15

Tunnel lining by compressed air, iI Ry Age 57:1143-4 D 18 '14

Concrete mixers

Baby mixer proves economical. Eng N 74:554 S 16 '15

Batch timing and measuring device on a concrete mixer, il Eng N 72:1278 D 24 '14

Blystone mixer for concrete, plaster and mortar. il Bldg Age 37:81 F '15 Concrete mixer and atomizer. il Eng & Contr 42:509-10 N 25 '14
Devices for insuring correct mix on high-class work. il diags Eng Rec 72:177-8 Ag 7 '15
Grouting machine; a Marsh-Capron mixer for concrete grouting. il Munic J 39:160 Jl 29 '15.

Mixer

ixer plant on flat car propels itself along the job. F. E. Cantwell. il Eng Rec 72:148 Jl 31 '15

the job. F. E. Cantwell, il Eng Rec 72:148 Jl 31 '15
New 3 1-2-cu. ft. concrete mixer. il Concrete Cem 5:271 D '14
Portable concrete mixer with elevator tower. il Eng N 73:826 Ap 29 '15
Proper regulation of air prevents clogging of pneumatic mixers. H. A. Leeuw. diag Eng Rec 72:459 O 9 '15
Rating concrete mixers. Elec Ry J 46:838 O

16 '15
Recent developments in concrete mixers, il
Eng N 73:716-18 Ap 15 '15
Self-propelled compressed-air mixing plant
lines Sandy Ridge tunnel under traffic, il
diags Eng Rec 72:353-5 S 18 '15
Small batch mixer with special loading feature,
il Concrete Cem 6:107 F '15
Small size concrete mixer, il Eng & Contr 44:
214-15 S 15 '15
Smith-Chicago low charging concrete mixers,
il Good Roads n s 10:271 N 6 '15; Ry Age
59:746 O 22 '15

Concrete mixing

oncrete mixing
Aggregate mechanically handled from pit to
road, il Eng Rec 72:133-4 Jl 31 '15
Concrete cribs used successfully in dock construction at Victoria, il diags plans Eng Rec
72:165-7 Ag 7 '15
Conveying concrete mixer, il diags Concrete
Cem 7:49-50 Jl '15
Dry mixing of concrete in a batch mixer before adding water Concrete Cem 6:157 Mr.

fore adding water. Concrete Cem 6:157 Mr

Effect of duration of mixing on the strength of concrete, H. H. Scofield, Eng & Contr 43: 78-9 Ja 27 '15

78-9 Ja 27 '15
English specifications for a bituminous concrete mixing plant and details of the acceptance test. W. H. Grieves. Eng & Contr 42: 325-6 S 30 '14
Eye is best means of controlling consistency of mix. Eng Rec 72:169 Ag 7 '15
Field methods in concrete construction.

of fills. Eng Rec (2:169 Ag 7 16) Field methods in concrete construction. J. Cochran. Concrete Cem 6:81-3 F '15 Floating mixing plant with tower for concreting on river work. il Eng Rec 71:89 Ja 16 '15 Heating concrete aggregates. Concrete Cem

ling on river.

Heating concrete aggregate.

6:212-13 Ap '15

Methods and costs of concreting for modern pavement. S. Gausmann. Elec Ry J 45:718-19

Ap 10 '15; Excerpt (Track concreting costs vary with mixing methods). Eng Rec 71:451

Microscope as a check on construction.

Johnson, il Eng Rec 71:263-5 F 27 '15

Microscope shows importance of mixing as a factor in making strong concrete, N. 'C. Johnson. il Eng Rec 71:301-3 Mr 6 '15 Mixer car placed in center of train saves wheeling. il Eng Rec 72:641 N 20 '15

Mixing, curing and placing concrete with high pressure steam. H. P. Brown, il Eng & Contr 43:199-200 Mr 3 '15; Abstract. Eng Rec 71: 252 F 20 '15

New records in mixing and placing concrete. Concrete Cem 7:67 Ag '15

Proper method of mixing concrete. Bldg Age 37:30 My '15

Proportioning aggregates for Portland cement concrete. A. Moyer. Am Gas Light J 101:214-5+ O 5 '14', Same. Eng & Contr 42:150-1 Ag 12 '14', Same cond. Eng Rec 70:37-8 Jl 11 '14', Discussion. C. M. Chapman; W. M. Kinney. 70:38-9 Jl 11 '14', Abstract. Concrete Cem 5: 66-7 Ag '14

Railroad mixing plant has bins on mixer car fed by crane. M. B. Uhrich, il Eng Rec 72: 521-2 O 23 '15

What amount of water should be used in concrete mixtures. H. C. Campbell. Sci Am 113: 81 Jl 24 '15

Concrete mixing —Continued

Will mixing concrete too wet cause its eventual failure? Concrete Cem 6:254-5 My '15

Yardage record at Kensico dam due, in part, to operation of mixers. G: T. Seabury. Eng Rec 71:199 F 13 '15

See also Concrete mixers

Concrete piling

Concrete piling
Concrete anchor piles for steel sheeting, diags
Eng N 72:1220-1 D 17 '14
Concrete culvert pipe and concrete piles, Ry
Age 59:762-3 O 22 '15
Concrete pile and cylinder foundations at
Charleston, il diag Eng N 74:926-9 N 11 '15
Concrete pile holder foundation at Lynn, F. E.
Drake, il diags Am Gas Light J 102:163-6
Mr 15 '15; Discussion, 102:235-7 Ap 12 '15
Concrete trestles on Tennessee division second track, Illinois Central R. R. M. Johnson, il Ry R 56:715-18 My 29 '15
Data on the design and cost of concrete piles
used on railroad work, diags Eng & Contr
43:452-3 My 19 '15
Explosives for driving concrete piles, F. T.

43:452-3 My 19 '15
Explosives for driving concrete piles. F. T.
James. Eng N 74:558-9 S 16 '15
New deep water pier at Halifax, Nova Scotia.
A. F. Dyer. il Concrete Cem 7:7-13 Jl '15;
Same cond. Eng N 73:1204-10 Je 24 '15
Unit-construction system applied to a threemile concrete viaduct to reduce the cost. il
diags Eng Rec 72:249-50 Ag 28 '15

Concrete pipe association, American, See American concrete pipe association

Concrete pipes. See Pipes, Concrete

Concrete pipes. See Pipes, Concrete

Concrete placing

Beanfield gravity system for distributing concrete, il diag Concrete Cem 7:48-9 Jl '15

Chutes for depositing concrete by gravity.

H. C. McClure, Concrete Cem 5:249 D '14

Concrete chuting plant with braced boom and chute. E. L. Jones. il Eng N 73:193-4 F 4 '15

Concrete dome for the new Technology buildings, Cambridge, Mass. il Eng N 74:385-6 Ag

26 '15
Concrete hoist of simple construction. il diags
Concrete Cem 7:127-8 S '15
Concreting methods and records, Elephant
Butte dam, E. H. Baldwin, diags Eng N 74:
696-8 O 7 '15
Concreting plant with a braced double tower,
il plan Eng N 73:442-3 Mr 4 '15
Concreting the Spaulding dam, California. il
Eng N 73:1057 Je 3 '15
Construction plant at the Nepaug dam, Hart-

Construction plant at the Nepaug dam, Hartford, Conn. il Eng N 74:25-6 Jl 1 '15 Cost of depositing concrete in bags under water. H. R. Ferriss. Eng & Contr 43:128 F 10

water. H. R. Ferriss. Eng & Contr 43:128 F 10 '15
Improved chuting of concrete. A. M. Wolf. Eng N 74:612 S 23 '15
Light traveling elevator facilitates concreting on building work. R. Shannon. il diags Eng Rec 71:755 Je 12 '15
Long reach given mixer boat by trussed boom supporting chutes. C. R. Andrew. il Eng Rec 72:552 O 30 '15
Minimum slope for concrete chutes. W. H. Insley. Eng & Contr 44:400 N 17 '15
Mixing, curing and placing concrete with high pressure steam. H. P. Brown. il Eng & Contr 43:199-200 Mr 3 '15
Movable concrete tower; home-made skip. L. E. Palmer. il Eng N 73:637 Ap 1 '15
Nearness of railway tracks aids concreting of retaining walls. K. C. Cardwell. il Eng Rec 72:269-70 Ag 28 '15
Paving river-beds with concrete. il Sci Am 113:362+ O 23 '15
Placing concrete in reservoir walls by compressed air, Montreal. il diag Eng N 73:122-3 Ja 21 '15

Ja. 21 '15

Placing concrete in wall and dam of water supply reservoir at Montreal by compressed air method. il diag Eng & Contr 43:138 F 10

Placing concrete under water. Concrete Cem 6:249-51 My '15

Placing concrete under water, B: A. How L. C. Wason. Concrete Cem 5:253-4 D '14 Howes:

Placing the Milwaukee waterworks intake crib. R. E. Stoelting. il diag Eng N 73:1058-9 Je 3 '15

Plastic concrete mattress for river revetment. il diags Eng N 74:262-3 Ag 5 '15
Pneumatic outfit delivers concrete 1300 feet to tunnel forms. il Eng Rec 71:246 F 20 '15
Proper regulation of air prevents clogging of pneumatic mixers. H. A. Leeuw, diag Eng Rec 72:459 O 9 '15
Records of operation in handling concrete with compressed air. il diag Concrete Cem 5:260-3 D '14

compressed air. il diag Concrete Cem v. D'14
Test concrete poured 700 feet through vertical pipe. Eng Rec 72:476 O 16 '15
Trussed-steel chute places concrete economically on slope. H. V. Knouse. il Eng Rec 72:491 O 16 '15
Wear of pipe and trough conveyors for concrete and concrete materials. Eng & Contr 43:235-6 Mr 17 '15
World's record in concrete placing. J. E: Cassidy. Eng Rec 71:276 F 27 '15
See also Concrete lining; Gunite

Concrete plants

Central plant for concreting over large area. F. L. Shea. il plan Eng N 74:458-9 S 2 '15 Cold weather construction methods used in erecting Hotel Traymore. D. L. Kneedler, il diags Concrete Cem 7:172-4 N '15 Concrete fence post factory of the C. B. & Q. R. R. co., Havelock, Neb. W. W. Eldridge, il Concrete Cem 6:99-101 F '15 Concrete mixing and placing. Ford building.

Concrete mixing and placing, Ford building, Buffalo. il plan Eng N 74:1083-4 D 2 '15 Concrete plant for Barge canal lock. il diags Eng N 73:1078-9 Je 3 '15

Concreting plant for large Chicago warehouse, il plans Eng N 74:289-91 Ag 12 '15 Concreting plant with one-man control. il Eng N 73:1132 Je 10 '15

Concreting plant with one-man control. il Eng N 73:1132 Je 10 '15

Construction plant and methods for concrete work on the Lock twelve dam, Coosa river, Alabama. E. L. Sayers and A. C. Polk, diags plan Eng & Contr 43:260-5 Mr 24 '15

Construction work on Traymore hotel, Atlantic City. il plan Eng N 74:80-1 Jl 8 '15

Equipment of a concrete brick plant in hospital broom shop. H. E. Jenks. il plan Concrete Cem 6:193-5 Ap '15

Features of a large winter concreting job. il plan Eng N 73:538-40 Mr 18 '15

Layout, operation and selling methods of a structural tile manufactory. H. Whipple. il diag Concrete Cem 6:64-9 F '15

Methods and plant used in constructing the foundations for the Field museum of natural history, Chicago, Ill. il plans Eng & Contr 44:402-5 N 24 '15

One huge single-lift lock at Louisville will

nistory, Chicago, Ill. ii plans Eng & Contr 44:402-5 N 24'15
One huge single-lift lock at Louisville will guard the entrance to the Portland canal, il plan Eng Rec 71:794-6 Je 26'15
Reinforced-concrete frame of Hotel Traymore erected at rate of a floor a week, ii plans Eng Rec 72:50-1 Jl 10'15
Reinforced-concrete shaft sets. L. D. Davenport, il plans Eng & Min J 99:447-8 Mr 6'15
Superstructure of Chicago municipal pier, il Eng N 74:306-8 Ag 12'15
Track elevation work of the Chicago & Western Indiana R. R., in Chicago, il plan Ry R 57:651-3 N 20'15
Unit-construction system applied to a three-mile concrete viaduct to reduce the cost. il diags plan Eng Rec 72:248-51 Ag 28'15
Well-designed concrete plant aids construction of waterworks dam, il plan Eng Rec 72:602-4 N 13'15

72:602-4 N 13 '15

Concrete plants, Portable

Concreting trains for track-elevation work, il

Eng N 74:315-17 Ag 12 '15

Floating concreting plant with mixer in tower,
il Eng N 74:318-19 Ag 12 '15

Mast and boom concreting plant, R. C. Hardman, il Eng & Contr 43:427-8 My 12 '15

Placing a concrete lining in the Sandy Ridge
tunnel, il plan Ry Age 59:533-6 S 17 '15;
Same, Ry R 57:327-32 S 11 '15; Same (Selfpropelled compressed-air mixing plant) Eng
Rec 72:353-5 S 18 '15

Portable hoist towers for concreting, il diag Eng N 72:1312-13 D 31 '14

Railroad mixing plant has bins on mixer car fed by crane, M. B. Uhrich, il Eng Rec 72: 521-2 O 23 '15

Concrete poles. See Poles, Concrete

Concrete pontoons. See Pontoons, Concrete Concrete posts. See Fence posts, Concrete Concrete protection. See Concrete-Protection

Concrete railings. See Railings, Concrete

Concrete railroad ties. See Railroad ties, Con-

Concrete reservoirs. See Reservoirs, Concrete Concrete roads. See Roads, Concrete

Concrete roofs. See Roofs, Concrete Concrete sewers. See Sewers, Concrete

Concrete sidewalks. See Sidewalks, Concrete

Concrete silos. See Silos, Concrete

Concrete slabs

Casting concrete-slab bridges for the Pennsylvania R. R. L. M. Schrufer. il diag Eng N 74:125-6 Jl 15 '15

Chart for the design of concrete slabs. Concrete Cem 7:29 Jl '15

Chicago flat-slab ordinance; discussion. Eng N 72:1274-7 D 24 '14

Chicago flat-slab ordinance; discussion. Eng N 72:1274-7 D 24 '14 Data on reinforced concrete railroad bridges and extent to which such bridges are used. diags plan Eng & Contr 43:29-22 Ja 13 '15 Designing of reinforced concrete slabs subjected to bending and compression. A. Bull. Eng & Contr 43:454-6 My 19 '15 Economic design of concrete slabs. J. N. Jensen. Eng Rec 71:170-1 F 6 '15 Federal court of appeals decision on flat slab patents. Eng N 73:91-2 Ja 14 '15 Field methods in concrete construction—beam and slab forms. J. Cochran. diags Concrete Cem 6:285-84 Je '15 Figuring strength of concrete roof slab. Bldg Age 37:55 Ap '15 Fiat-slab bridges at Denver combine permanency and good appearance. W. H. Wheeler and C. A. P. Turner. il diag Eng Rec 72:38-40 Jl 10 '15 Flat slabs in 1900. B. W. Adams. Concrete Cem 6:213-14 Ap '15 Girderless concrete slabs. D: F. Stockbridge. Eng Rec 71:180 F 6 '15 Large saving in steel effected by new system of flat-slab reinforcement; Youth's companion building. il plans Eng Rec 72:450-2 '0 '9 '15

9 '15

Material cost of concrete slabs. Concrete Cem 7:182 N '15

Mechanics of reinforced concrete under flexure in beam and slab types. C. A. P. Turner. in beam and slab types. C. A. P. Turner. Boston Soc C E J 1:383-94 S '14; Discussion. 1:499-508; 2:23-47 N '14, Ja '15

Results of tests of cinder concrete floor slabs, with conclusions and recommended methods of design. H. Perrine and G: E. Strehan. Eng & Contr 43:379-83 Ap 28 '15

Results of tests to determine the distribution of loads from concrete floor slabs to steel joists; abstracts. Eng & Contr 44:365-7 N 10 '15; Eng Rec 72:578-80 N 6 '15; Eng N 74:933 N 11 '15

Shrinkage and time effects in reinforced concrete. F. R. McMillan, il Minn U Bul 3:1-41 '15; Abstracts. Eng N 73:502-3 Mr 11 '15; Eng Rec 72:251-2 Ag 28 '15; Eng & Contr 44: 306-10 O 20 '15

Test of a peculiarly designed concrete slab. il diags Eng N 73:1070 Je 3 '15

est of full-size reinforced-concrete bridge slab. Eng Rec 71:26 Ja 2 '15

Thin concrete base, reinforced, for pavements. C. S. Pope; J. I. Tucker. Eng Rec 72:174-5 Ag 7 '15

Thin concrete base, reinforced, may save 50 cents a square yard in paving costs. J. Tucker. Eng Rec 71:719-20 Je 5 '15

Concrete stairways. See Stairways, Concrete Concrete standpipes. See Standpipes, Concrete

Concrete stone New Delaware and Hudson office building at Albany, N. Y. M. T. Reynolds, il Concrete Cem 6:289-93 Je '15

Patents on sand molds in concrete stone manufacture. Concrete Cem 7:136 O '15

Stone facing aggregates in colors. Concrete Cem 7:159 O '15

Synthetic stone as used in the construction of Catskill aqueduct buildings. H. L. Rogers, il diags Concrete Cem 6:125-8, 132-3 Mr '15; Abstract. Eng M 49:272 My '15 Use of lime hydrates in factory-made concrete units. Concrete Cem 7:186-7 N '15

Concrete tanks. See Tanks, Concrete Concrete ties. See Railroad ties, Concrete

Concrete tile ayout, operation and selling methods of a structural tile manufactory. H. Whipple. il diag Concrete Cem 6:64-9 F '15 Lavout. See also Drain tile

Concrete trestles, See Trestles, Concrete

Condemnation of land

Right of a mining or ore-milling company to condemn land. A. L. H. Street. Eng & Min J 100:757 N 6 '15

Condensed milk, See Milk, Condensed

Condenser manifold

How time and money were saved by welding; oxy-acetylene process saved 13 days, it Foundry 43:235 Je '15

Condensers, Ammonia. See Ammonia condensers

Condensers (electricity)
Helsby lower condensers, il Elec R & W
Elec'n 67:856-7 N 6 '15'
Moscicki condenser; abstract, C. C. Garrard,
diag Elec W 66:710 S 25 '15

Condensers (steam)

ondensers (steam)
Air in jet-condenser practice. E. Brown.
Power 41:404-5 Mr 23 '15
Barometric condenser used as a water heater.
K. M. Gilbert, plan Power 42:230 Ag 17 '15
Basis for rational design of heat transfer apparatus. E. E. Wilson. Am Soc M E J 37: 546-9; Discussion. 37:549-51 S '15
Cleaning of condenser tubes. Power 42:738 N

Condensers for evaporating apparatus. E. W. Kerr. diags Met & Chem Eng 13:551-7 S 1

Corrosion of condenser tubes. E. Bate. Gen Elec R 17:882-90 S '14; Abstract. Met & Chem Eng 12:656-7 O '14; Abstract. Ind Eng 14:413-14 O '14

Corrosion of condenser tubes. Power 41:355 Mr 9 '15
Deane ejector condenser. il Power 41:546 Ap 20 '15

20°15
Erecting 3000-hp. barometric jet condenser.
C: A. Hirschberg. il Power 42:546-8 O 19°15
High vacuums with surface condenser. il
Power 42:338-9 S 7°15
Interpretations of data on steam-condenser
performance. H. A. Cozzens, jr. Elec W 66:
1084-5 N 13°15
Large-sized surface condenser. il diag Elec W
65:124 Ja 9°15
Large surface condenser for Commonwealth
Edison company. diag plans Power 41:474-7
Ap 6°15
Modern power-house condensing plant. A. Ar-

Ap 6 '15
Modern power-house condensing plant. A. Arnold. Inst E E J 53:848-50 Je 15 '15
New condenser gage: the Scanes vacuum efficiency and absolute pressure gage. diag Power 40:877-8 D 22 '14
Notes on the cooling of condensing water. C. S. Jeffrey. Inst E E J 53:824-8 Je 15 '15
Outfit for testing surface-condenser tubes. J. Parrish. diag Power 42:624 N 2 '15

J. Parrish. diag Power 42:624 N 2 '15
Popular misconceptions concerning condensers.
F. R. Low. Power 42:16-17 J1 6 '15
Removing air from condensers. G: W. Caywood. plan Power 41:723 My 25 '15
Removing the air from surface condensers.
E: T. Binns. il Power 42:591-2 O 26 '15
Scheme to detect salt-water leakage in surface condensers. il Elec W 66:1093 N 13 '15
Simple physical tests for condenser tubes.
H: A. Cozzens, jr. il Elec W 66:642 S 18 '15
Surface condenser; with discussion. C. F.
Braun. diags Am Soc M E J 37:459-65 Ag '15
Two-stage condenser. P. Bancel. diags Power
42:402-7 S 21 '15; Excerpts. Elec W 66:1148-9
N 20 '15

Ways of cleaning steam condenser tubes that save time. Elec W 66:1031-2 N 6 '15

See also Cooling towers; Steam engines Conductivity, Electric. See Electric conductivity Conductors, Electric. See Electric conductors Conduits

onduits and insulation for heating pipes. C: L. Hubbard, diags Dem Eng 72:252-3 Ag 28 15 Conduits

Oneida street crossing under Milwaukee river. il plan Eng Rec 70:616-17 D 5 '14

See also Electric conduits; Subways (conduits); Water conduits

Confectionery

Electric drive in confectionery making, il Elec W 65:791-2 Mr 27 15

Conference of governors

th annual conference, Boston, Aug. 24-27. Elec R & W Elec'n 67:482-3 S 11 '15

Congo. See Kongo, Belgian

Coniferae

offire of the coniferae. IV—The leaf and twig oils of digger pine, lodgepole pine, and red fir. A. W. Schorger. J Ind & Eng Chem 7:24-6 Ja '15

Ja '15
Tannin content of Pacific coast conifers.
H. K. Benson and T: G. Thompson, il J Ind
& Eng Chem 7:915-16 N '15
Yield of by-products from destructive distillation of some western conifers. H. K. Benson and M. Darrin. J Ind & Eng Chem 7:
916-18 N '15

Conjuring

Methods of Hindu jugglery and magic: the Indian basket trick. S. Ghosh. il Sci Am 111: 526+ D 26'14

Connecticut

Connecticut
Colonial architecture in Connecticut. W. S.
Bessell. il Arch Rec 37:360-9, 445-52, 547-56;
38:672-80 Ap-Je, D '15
Connecticut master plumbers' association
25th annual convention, Bridgeport,
May 12. Dom Eng 71:223-5 My 22 '15

Conservation of resources

National conservation and water powers. H. H. Chapman, il Am For 21:981-6 O '15 See also Forest conservation

Constantinople

Defenses

Defenses of Constantinople, H. C: Woods, il Sci Am S 80:2-3 J1 3 15

Constitution (frigate)
Fight between the Constitution and the Guerrière, il Sci Am 113:14-15 Jl 3 '15

Constrained wave. See Ship resistance

Construction. See Architecture; Building; En-

Construction camps
Buffalo, Rochester & Pittsburgh standard outfit cars. il plans Ry Age 58:1445-7 Je 18 '15
Construction camp, Elephant Butte, N. M.
J. D. Graham. il diags map Eng N 72:1300-4
D 31 '14

Feeding the multitude; experiences in boarding a construction force of 5,000 men. Eng & Contr 43:sup28-9 My 5 '15 Knockdown camp buildings. C: E. Bee, il diag Eng N 73:31-2 Ja 7 '15 Messhouse management at the Arrowrock dam, R. R. Clawson, il Eng N 73:1201-3 Je 24 '15

Modern small sized construction camp with some costs on feeding men. E. W. Robinson. plan Eng & Contr 43:318-20 Ap 7 '15 Organization and equipment of convict camps in Georgia; methods and cost. J: C. Koch, il diag Eng & Contr 43:433-5, 500-2 My 12, Je 2 '15

2 '15
Quebec-bridge camp and yards, il plan Eng
N 74:748-9 O 14 '15
Six types of construction camp garbage and
refuse incinerators, diags Eng & Contr 44:
163-5 S 1 '15
Solution of the construction camp club house
problem. Eng & Contr 44:118 Ag 18 '15
System in managing camp boarding-house
pays contractor, T. Eadington. Eng Rec 71:
662 My 22 '15.

pays contract 662 My 22 '15

Consular service

Consular service in business getting, Iron Age 96:526-7 S 2 '15
Plea for scientific and technical commissioners.
W. P. Digby, Inst E E J 53:799-801 Je 1 '15;
Excerpts, Met & Chem Eng 13:502 Ag '15

Contact electricity
Contact electrication and the electric current, F. Sanford, Sci Am S 80:322-3 N 20 '15

Continuation schools. See Evening and continuation schools

Continued fractions. See Fractions, Continued Contraband of war

See also Cotton as contraband of war Contract letting. See Contracts, Letting of

Contractors

Officiations of the Accounting system for contractors. Elec R & W Elec'n 66:152 Ja 23 '15
Business relation between contractor and engineer. H. B. Bushnell, Munic Eng 49:73-4

Ag '15 Contractor and management engineering. Eng & Contr 42:573 D 23 '14 Contractor's method for holding good men. M. C. Tuttle. Eng N 73:694-5 Ap 8 '15 Cost of doing business. G: W. Hill. Dom Eng 71:157. 306-7 My N. Je 12 '15 ost of doing business. G: W. Hill. Dom Eng 71:157. 309-7 My S. Je 12 15 ost system for contractor or jobber. Metal Work 83:599-600+ Ap 23 '15 iesel engine for the contractor—why not? H. D. Hammond, il Eng Rec 71:409-10 Mr 27 '15

Diesel

27 '15
Does publication of costs endanger the contractor? Eng & Contr 42:329-30 O 7 '14
Efficiency system for road contractors. J: H. Hammond. Eng & Contr 43:552-4 Je 23 '15
Engineering contractor. H. P. Gillette. Eng & Contr 44:315-17 O 20 '15
Engineers from the contractor's viewpoint. R: W. Sherman. Eng N 72:1138 D 3 '14
From the contractors' point of view. W. A. Rogers. Eng Rec 71:15 Ja 2 '15
Greater care in employing workmen will pay the contractor. H. D. Hammond. Eng Rec 71:501-2 Ap 17 '15
Guide posts in the contracting business. J. C.

71:501-2 Åp 17 '15
Guide posts in the contracting business. J. C. Walker. Metal Work 83:607-9 Åp 23 '15
Keeping accurate daily and total cost sheets will pay the contractor. C. B. Montgomery. Eng Rec 71:535-6 Åp 24 '15
Model record of distribution of construction plant. il Eng N 74:218-19 Jl 29 '15
Problem of extras. Concrete Cem 5:255 D '14
Selecting construction power-plant system. Eng N 74:2953-7 N 18 '15
Specialized experience of engineers and con-

Eng N 742065-7 N 18 15 Specialized experience of engineers and contractors vital to country's defense. G: Perrine. il Eng Rec 72:594-6 N 13 '15 System for the engineer and contractor. T: Barwick. Heat & Ven 11:27-34 N; 15-21 D '14; 12:18-22 Ja '15

See also Day labor; Electric contractors Contractors' camps. See Construction camps

Contracts

Acceptance binds parties to contract. E. J. Buckley. Metal Work 84:655 N 19 '15 Avoiding being at salesmen's or solicitors' mercy. E. J. Buckley. Elec R & W Elec'n 67:485-6 S 11 '15

Changing plans on the contractor. Eng Rec 71:351 Mr 20 '15 Comment on cost of quantity surveys of build-

ings and a proposed survey guarantee. W. K. Palmer, Eng & Contr 48:5118-19 Je 9 '15 Contracts by municipal officers. J: Simpson. Munic J 39:807-8 N 25 '15

Contractual relations between clients and accountants, H. M. Temple, J Account 20:291-

Court decision on the inviolability of test boring records. Eng & Contr 43:416-17 My 12 '15 Effect of contract not to go again into plumbing business. Dom Eng 70:170 F 6 '15

How a Utah mining contract was interpreted. A. L. H. Street. Eng & Min J 100:675-6 O 23 '15

Misleading boring records are grounds for re-covery of damages by contractors. Eng Rec 71:554-5 My 1 '15

Some contracts must be in written form. E. J. Buckley. Metal Work 83:491 Mr 26 '15

See also Bridge contracts; Building contracts; Commercial law; Contractors; Guaranties and sureties; Heating contracts; Partnership; Roads—Contracts; Sales; Street lighting—Contracts; Trade agreements

Contracts, Letting of
Alternate specifications for public work are
legal. D. T. Pierce. Eng N 74:1048-50 N 25

Track rack work by contractor or way depart-ment. S. Gausmann. Elec Ry J 45:895-6 My 8 715

Controllers, Electric. See Electric controllers

Convalescent homes

Plains, N. Y. il Arch & Bidg 47:317-23 S '15
Plains, N. Y. il Arch & Bidg 47:317-23 S '15
Plumbing and heating in Burke home. il Metal
Work 83:506-7+ Ap 2 '15
Winifred Masterson Burke relief foundation,
White Plains, N. Y.; views and plans.
Brickb 24:pl 91-6 Jl '15

Conversion tables. See Temperature-Measure-

Converters

Concentration of gold in bottoms in the copper converter; abstract. H. F. Collins. Met & Chem Eng 13:446 Jl '15

Copper converter patent, diag Met & Chem Eng 13:924 D I '15 Ganister-lined converters, J: Gregson, Iron Age 94:1292 D 3 '14

Limitations of the electric furnace in the manufacture of steel castings. E. F. Lake. Met & Chem Eng 13:137-8 Mr '15

See also Foundry practice; Metallurgy; Ore treatment

Converters, Rotary. See Rotary converters Converters, Synchronous. See Rotary converters

Convex heads. See Boiler heads

Conveying machinery

onveying machinery
Belt conveyors will help simultaneous driving and lining of air tunnel, G. D. Emerson, il diags map Eng Rec 72:218-19 Ag 21 '15
Conveyor-belt calculating chart, J. D. Mooney and D. L. Darnell, Am Inst Min E Bul 105: 1937-9 S '15; Same. Eng & Min J 100:562-3 O 2 '15; Same. Met & Chem Eng 13:818-19 N 1 '15; Abstract, Am Soc M E J 37:610-11 Conveyors and conveyors and conveyors and conveyors and conveyors and conveyors.

Conveyors and conveyor systems. C. F. Herington. diags Mach 21:386-8 Ja '15 Cost of conveyors at the Arizona copper co.'s new smeltery. diags Eng & Min J 99:329-30 F 13 '15 Cost of the diagram.

of a portable belt conveyor. A. C. Haskell, diag Eng & Contr 44:204 S 15 '15 Gifford-Wood bucket conveyor. il Power 42:78

Handling bricks with gravity roller conveyors. W. B. Conant. il Eng N 74:834-5 O 28 '15 Marine terminal machinery. H. Sawyer. Int Marine Eng 20:109-11 Mr '15 Mechanical handling of coal and ashes in the power plant. C. C. Brinley. il diags Eng M 49:872-87; 50:65-77 S-O '15 Methods and costs of belt conveyor earth-handling for the Lahontan dam. Eng & Contr 44:414 N 24 '15 Simple conveyor-belt cleaner. il Eng & Min J 100:601 O 9 '15

100:601 O 9 '15

Unique conveyor in automobile plant. il plan Iron Age 96:565-8 S 9 '15

See also Ash handling; Buckets; Cableways; Coal handling; Cotton handling; Cranes, derricks, etc.; Freight handling; Hoisting machinery; Loading and unloading; Mail handling; Mechanical handling; Mining machinery; Ore handling; Pneumatic tubes; Telpherage

Conveyors. See Conveying machinery

Convict labor

Colorado makes 50 per cent saving with convict labor. J. E. Maloney, Eng Rec 72:444 O

Convict classification for state road work. G. P. Coleman. Eng Rec 71:751-2 Je 12 '15

Convict labor for highway work. G. P. man. Good Roads n s 10:208-10 O 2 '15

Convict labor in road construction in Colorado; with discussion. T. J. Ehrhart. Good Roads n s 9:101-3 Mr 6 '15; Excerpt. Eng

Convict labor on country roads. G: C. Warren. il Munic Eng 48:26-35 Ja '15

Convict work in Arizona. F. G. Twitchell. Munic J 39:430-2 S 16 '15 Organization and equipment of convict camps in Georgia; methods and cost. J: C. Koch. il diag Eng & Contr 43:433-5, 500-2 My 12, Je

Road building by convict labor. il Good Roads n s 8:211-16 D 5 '14
Road building with convict labor in Fulton county, Georgia. W. T. Wilson. il Eng & Contr 42:440-2 N 4 '14
Road construction in Reading township, Livingston county, with convict labor. B. H. Piepmeier. il Eng & Contr 44:39-41 Jl 14 '15
Utilization of short-term convicts for highway work in Georgia. J. L. Stanford. Munic Eng 48:124-6 F '15; Same. Eng & Contr 43: 2:0-1 Mr 31 '15

Cook, Frederick Albert, 1865-Dr. Cook and Crocker Land. E. S. Balch. Sci Am 113:359 O 23 '15 Dr. Cook as an object lesson. Sci Am 113:286 O 2 '15

Cook county, Illinois
Cook county tuberculosis colony at Oak Forest, Ill. C. A. Erikson. il plans Brickb 24: 273-6, pl 158-60 N '15
Highway program of Cook county, Illinois. il map Eng Rec 70:648-9 D 12 '14

#### Charities

Cook county infirmary at Oak Forest, Ill. C. A. Erikson, il plans Brickb 24:277-82, pl 161-5 N '15

Cookers, Steam. See Steam cookers Cookery

See also Baking powder; Canning and pre-erving; Electric cooking; Gas cooking; serving: Kitchens

Cooking fats. See Oils and fats Coolidge tube. See X rays

Air cooling. Air cooling with water barrels.
J. Simmons. il Eng & Min J 100:189 Jl 31 '15
Air cooling plant, New York Central R. R.,
Mott Haven yard, New York. M. Purcell and
M. F. Gannon. il plans Ry R 56:703-5 My 22
'15 Cooling

715
Air cooling with water. I. N. Evans. Heat & Ven 12:41 Jl '15
British Portland cement making machinery; cooling of cement clinker. diags Engineer 120:126-8 Ag 6 '15
Cooled drinking water. R. F. Massa. Am Water Works Assn J 2:422-33 Je '15; Abstract. Eng M 49:316-17 S '15
Cooling two rooms in a country residence. A. M. Feldman. diags Heat & Ven 11:33-4 Mr '14; Same. Dom Eng 66:298 Mr 7 '14; Same. Metal Work 81:282-3 F 13 '14; Same, with discussion. Am Soc Heat & V E 20:79-85 '14
Cooling water and air for power plants. il Sci Am S 80:117 Ag 21 '15
Counter-current lubricating oil cooler. diag

Counter-current lubricating oil cooler. diag Iron Age 96:199 Jl 22 '15

Heating and ventilating an office building by electricity: Hydraulic power co.'s plant at Niagara Falls. C. F. Herington, il diags plan Heat & Ven 12:13-22 Je '15

Principle factors governing the choice of method of cooling power transformers as related to their first cost and operating conditions. W. S. Moody, il Gen Elec R 18: conditions. W 839-41 Ag '15

Sprays for cooling water, il diag Met & Chem Eng 13:401 Je '15

Survey of the refrigeration field as it exists today. H. I. Holleman. Gen Elec R 18:65-7 Ja '15

Ventilating and cooling a church, plan Bldg Age 37:61-2 S '15

Ventilating and cooling church edifice, plan Metal Work 82:757-8 D 11 '14

Ward-cooling plant in a hospital. A. M. Feldman, il plans Am Soc Heat & V E 20:74-9 '14; Same. Metal Work 81:336-8 F 27 '14; Same cond. Heat & Ven 11:21-3 F '14

See also Automobile engines—Cooling; Cold storage; Cooling ponds; Cooling towers; Cooling water; Gas and oil engines—Cooling

Cooling ponds

Cooling plant at Bluestone. Elec Ry J 45:1123

Je 12 '15 Cooling ponds for condensing engines, L. H. Parker, il Textile World 49:626-30 S '15 Cooling-water pond and system for a city sub-station. F. Buch, diag Elec W 65:297-9 Ja 30 '15

Costs on cooling-pond construction, il Elec W 66:808-9 O 9 '15 66:808-9 O 9 '15 Gain by use of spray nozzles, il Power 42:578 O 26 '15

O 26 '15

Making a spray cooling pond, J. I. Blair, il plan Power 41:516 Ap 13 '15

New spray head for cooling ponds, il diag Elec W 66:880 O 16 '15

Spray cooling systems, L. H. Parker, Power 42:563-4 O 19 '15

Thomas spray head. il Power 42:644-5 N 9 '15

Cooling towers

ooling towers
Calculations for the operation of the cooling tower. W: Kent. Ind Eng 15:68-72 Ag '15
Cooling towers and cooling ponds: abstract. W. G. Stephan. Am Soc M E J 37:59 Ja '15
Cooling water of condensation; introduction to a collection of psychrometric tables for cooling tower work. Textile World 49:692-4

Electrification on the London and South-west-ern railway, diags Engineer 120:348-9 O 8 '15 Forced-draft cooling towers. E. R. Goodrich, diag Power 41:121-4 Ja 26 '15

diag Fower 41:121-4 Ja 26 '15
Getting the proper vacuum in summer. J. Wilmore, diags Elec W 66:358-63 Ag 14 '15
Home-made cooling tower. A. D. Williams. II
diags Power 41:847-8 Je 22 '15
Notes on the cooling of condensing water.
C. S. Jeffrey. Inst E E J 53:824-8 Je 15 '15
Stocker cooling towers, il Power 42:305-6 Ag 31 '15

Two-stage condenser. P. Bancel, diags Power 42:402-7 S 21 '15 Vacuum fluid cooler, diags Power 41:542-3 Ap

Washington avenue power plant, Scranton, Penn. W. O. Rogers. il Power 41:869-70 Je 29 '15

Cooling water Gas-engine cooling water, G. A. Field, diag Power 41:438 Mr 30 '15

Cooperation

ooperation
Cooperative organization business methods.
W. H. Kerr and G. A. Nahstoll. bibliog U S
Agric Bul 178:1-24 '15
Manufacturing plant general store of the
Cleveland hardware company. F. L. Prentiss.
il Iron Age 96:235-6 Jl 29 '15
Works store operated at a profit. il Iron Age
95:1348 Je 17 '15

See also Profit sharing

Cooperative stores. See Cooperation

Absorption of gases by refined copper. W. Stahl, Eng & Min J 100:52 Jl 10 'l5 Action of acetylene on metals. A. C. Morrison. Sci Am 113:487 D 4 'l5 Battery assay of copper: report of subcommittee. J Ind & Eng Chem 7:546-7 Je 'l5 Commercial classification of refined copper. L. Addicks. Foundry 48:32-4 Ja 'l5; Same. Iron Tr R 56:329-31 + F 11 'l5 Conner assay S. Fischer ir Met & Chem Eng.

Copper assay. S. Fischer, jr. Met & Chem Eng 12:773 D '14
Copper deposits in the Red Beds of southwestern Oklahoma. A. E. Fath. il Econ Geol 10:140-50 F '15

Copper wire tables. U S Bur Stand Circ 31:1-76

Determining weight of deposit. L. C. Wilson. Metal Ind n s 13:152-4, 277-8 Ap, Jl '15 Effects of repeated remelting on copper. F. O. Clements, il Metal Ind n s 12:374-6 S '14; Same. Iron Tr R 55:486 S 10 '14; Same cond. Foundry 43:71-2 F '15

German copper reserves in electric circuits. F. Loppé. Eng M 50:117 O '15
Heat treatment of copper and brass. C. R. Hayward. il Metal Ind n s 13:275-7 Jl '15

Incremental armature copper losses at no-load and armature teeth Eddy-current losses. A. Press. diags Inst E E J 53:820-3 Je 15 '15

Metallography of copper. W: Campbell. Met & Chem Eng 13:721 O 15 '15

Molybdenum and copper. C. Vickers. Foundry 43:344+ S '15

Molybdenum and copper. C. Vickers. Foundry 43:344+ S '15
New test for copper. W. G. Lyle, L. J. Curtman and J. T. W. Marshall. Am Chem Soc J 37:141-81 Je '15
Physical properties of copper as effected by small quantities of phosphorus manganese and tin. C. P. Karr. Metal Ind n s 12:513-14

D '14
Reduction of copper oxide in alcohol vapor in reducing sugar determinations and copper analysis. A. Wedderburn, J Ind & Eng Chem 7:610-11 Jl '15
Specific heat of copper in the interval 0° to 50°
C. D. R. Harper, il U S Bur Stand Bul 11: 259-318 Mr 1 '15
Substitutes for copper in Germany. Flor W 66:

259-318 Mr 1 '15
Substitutes for copper in Germany. Elec W 66: 1040 N 6 '15
Symposium on copper. Met & Chem Eng 13: 657-62 O 1 '15
Use of hydrofluoric acid in the separation of copper and lead from tin and antimony by means of the electric current. L. W. Mc-Cay. Am Chem Soc J 36:2375-81 N '14
Welding copper and copper alloys by acetylene methods. J. F. Springer. Ry Age (Mech ed) 89:367-9 Jl '15
See also Brass: Browney Commonwealth.

See also Brass; Bronze; Copper metallurgy; Copper mines and mining, and other headings beginning Copper

Copper alloys

Brass and bronze—offsprings of copper. J. E:
Schipper. il map Automobile 33:315-19, 36870, 412-13 Ag 19-S 2 '15
Copper alloys with notes on brass founding.
H. L. Reason, diags Metal Ind n s 13:318-21
Ag '15

Ag '15
Fatigue of copper alloys. E. Jonson. Metal Ind n s 13:283-4 Jl '15; Same. Eng Rec 72: 22-3 Jl 3 '15; Same, with discussion. Foundry 43:311-12 Ag '15
Iodide method applied to the determination of copper in the presence of tin. R. W. Coltman. J Ind & Eng Chem 7:764-6 S '15
Melting point of copper alloys. Am Gas Light J 103:109 Ag 16 '15
Rapid analysis of bearing metals and high-copper content alloys. C. G. Lutts. Met & Chem Eng 13:346-7 Je '15

See also Brass; Bronze; Gun metal

Copper compounds

Salts of the halogenoacetic acids. W. G. Bateman and D. B. Conrad. Am Chem Soc J 37: 2554-7 N '15

Copper converters. See Converters

Copper cyanide
Copper cyanide plating solutions. M. C. Weber. Metal Ind n s 13:95-6 Mr '15; Same. Met & Chem Eng 13:255-6 Ap '15; Same. Foundry 43:197-8 My '15; Same. Sci Am S 79:302 My 8 '15
Economy and efficiency of copper cyanide. C: H. Proctor. Foundry 43:199-200 My '15
Economy of copper cyanide. C. Dittmar. Metal Ind n s 12:526 D '14 Copper cyanide

Copper founding
Application of the Coolidge tube to metallurgical research. W. P. Davey. il Gen Elec R
18:134-6 F '15; Same. Engineer 119:350-1 Ap
9 '15; Same. Sci Am S 79:331 My 22 '15
Boronized cast copper; abstract. E. Weintraub.
Met & Chem Eng 13:721 O 15 '15
Effects of repeated remelting on copper. F. O.
Clements. il Metal Ind n s 12:374-6 S '14;
Same. Iron Tr R 55:486 S 10 '14; Same cond.
Foundry 43:71-2 F '15

Copper industry and trade

Geary. Eng & Min J 99:191 Ja 23 '15 British Columbia copper co. Eng & Min J 100: 116 Jl 17 '15

hino Copper report for 1914. Eng & Min J 100:20-1 Jl 3 '15

Contributions of the chemist to the copper industry J. B. F. Herreshoff, J Ind & Eng Chem 7:274-5 Ap '15

Copper and the electrical industry, il Elec W 66:1017-19 N 6 '15

Copper in Germany. Eng & Min J 99:228-9, 252, 458 Ja 30, Mr 6 '15

Copper statistics. Eng & Min J 99:51-6 Ja 9 '15

Copper industry and trade—Continued
Miami Copper in 1914. Eng & Min J 99:766 My
\_\_1 '15

Nickel, copper and mercury as affected by the war. J Ind & Eng Chem 7:71-2 Ja '15
Non-ferrous metals and the war. W. R. Ingalls. Iron Age 96:420-1 Ag 19 '15
Position of copper during the war period.
J: B. C. Kershaw. Engineer 119:458-9 My

Production roduction of copper in 1914. Elec R & W Elec'n 66:312 F 13 '15

Elec'n 66:312 F 13 '15 Production of copper in 1914. Eng & Min J 99: 705 Ap 17 '15 Ray Consolidated in 1914. Eng & Min J 99: 707-8 Ap 17 '15 United States smelting, refining and mining co. report for 1914. Eng & Min J 99:823 My 8 '15

Utah Copper in 1914. Eng & Min J 99:824-5 My 8 '15 See also Butte & Superior copper co.

Copper metallurgy

Advances in copper smelting. F: Laist. Met & Chem Eng 13:658 O 1 '15 Anaconda leaching and acid plants. E. P. Mathewson. il plans Eng & Min J 99:723-7 Ap 24 '15

Mathewson. It plans Eng & Min J 99:723-7
Ap 24 '15
Arizona copper co.'s Dorr thickener. D; Cole.
il diag Eng & Min J 100:131-4 Jl 24 '15
Bolivian copper concentration. F. A. Sundt.
Eng & Min J 100:102 Jl 17 '15
Braden copper co.'s concentrator at Sewell,
Chile. Eng & Min J 100:894-5 N 27 '15
British Columbia copper co.'s smelter, Greenwood, B. C. F: K. Brunton. diags Am Inst
Min E Bul 103:1401-17 Jl '15
Case for copper hydrometallurgy; inexpensive
and efficient treatment of smelter flue dust
and carbonate ore. G: C. Westby. il Met &
Chem Eng 13:295-7 My '15
Cementation at the Wallaroo & Moonta mines.
il Eng & Min J 99:438-9 Mr 6 '15
Chloridizing blast roasting and leaching. G. A.
Keep. il diag Eng & Min J 99:265-9, 315-22
F 6-13 '15
Concentration at Nevada consolidated copper

Concentration at Nevada consolidated copper co. il diag Met & Chem Eng 13:716-17 O 15

Copper hydrometallurgy. Met & Chem Eng 13:451 JI '15
Copper hydrometallurgy; patent of R. F. Bacon. Met & Chem Eng 13:872 N 15 '15
Copper leaching; discussion. L. D. Ricketts and others. Met & Chem Eng 13:319-24 My

Copper metallurgy in 1914. Met & Chem Eng

13:5 Ja '15 Copper metallurgy of the southwest, J. Doug-las, flow sheet Met & Chem Eng 13:658-9 O 1 '15

O 1 '15 Copper Queen smelting works. R: H. Vail. il Eng & Min J 99:1-6 Ja 2 '15 Copper smelting in Japan. M. Eissler, il diags Am Inst Min E Bul 95:2661-2703 N '14; Dis-cussion. 101:1173-4 My '15 Copper smelting in the Caucasus. map Eng & Min J 99:650-3 Ap 10 '15 Crushing plant of the Ohio copper co.'s mill. R. S. Lewis. il diags Eng & Min J 99:748-50

Ap 24

Ap 24 '15
Design of modern copper plants, C: H. Repath.
Met & Chem Eng 13:660-1 O 1 '15
Designing small copper smelting plants, C: C.
Christensen, il Eng & Min J 99:225-8 Ja 30 '15

'15
Development of ore concentration. H: A. Marvin. il Eng M 49:218-30 My '15
Electrolysis of copper sulphate liquors, using carbon anodes. L. Addicks. il diag Met & Chem Eng 13:748-55 O 15 '15
Electrolytic copper refining; abstracts of papers by A. C. Clark and L. Addicks. Met & Chem Eng 13:661-2 O 1 '15
Equipment of Arizona smelters. J. Douglas. Met & Chem Eng 13:904 D 1 '15
Flotation at the Consolidated Arizona smelting co., Humboldt. Arizona, flow sheet Met &

co., Humboldt, Arizona. flow sheet Met & Chem Eng 13:897-901 D 1 '15
Hybinette leaching process for copper ores. Eng & Min J 100:602 O 9 '15
Hydro-electrolytic treatment of copper ores. R. R. Goodrich. il Am Inst Min E Bul 104: 1551-94 Ag '15; Abstract. Met & Chem Eng 13:766 O 15 '15

Hydrometallurgical treatment of Michigan copper tailings. R. D. Leisk, plan Met & Chem Eng 13:233-4 Ap '15
Improvements at the reduction works of the Anaconda company. F: Laist. Eng & Min J 99:418-19 F 27 '15
Improvements in electrolytic copper refining; patent granted to F. R. Pyne and H: M. Green. diag Met & Chem Eng 13:816 N1 '15
Laist roasting patents. diags Eng & Min J 99: 282-4 F 6 '15
Leaching at the Calumet & Hecla. Eng & Min J 99: 282-4 F 6 '15
Leaching copper with ammoniacal solutions. Met & Chem Eng 13:449-51 J1 '15
Leaching experiments on the Ajo ores. S. Croasdale. Am Inst Min E Bul 92:1881-1929 Ag '14; Abstract. Met & Chem Eng 12:591-3 S '14; Excerpt (Leaching-plant construction). Eng & Min J 98:961-3 N 28 '14; Excerpt (Manufacture of sponge iron as a precipitant for copper). Eng & Min J 99:326-8 F 13 '15; Excerpt (Leaching-plant operation). Eng & Min J 99:517-6 Mr 27 '15; Excerpts. Eng & Min J 99:59-6 Mr 27 '15; Excerpts. Eng & Min J 99:91-5 Ag '14. L. Addicks. Eng & Min J 99:91-5 Ja 9 '15
Metallurgy of copper in 1914. L. Addicks. Eng & Min J 99:91-5 Ja 9 '15
New copper metallurgy. H. A. Megraw. Il diags Eng M 48:675-88 F '15
Nodulizing in copper sheallurgy. J. H. Payne. Eng & Min J 99:17-19 Ja 2 '15
Present tendencies in copper Queen mines. C: M. Coats and G. L. Allen. Il diag plan Eng & Min J 99:17-19 Ja 2 '15
Present tendencies in copper metallurgy. E. P. Mathewson. Met & Chem Eng 13:141 Mr '15
Problems in copper leaching; discussion. Am Inst Min E Bul 100:711-37 Ap '15; Discussion. 108:2459-60 D '15
Progress in copper metallurgy in the Globe district, Arizona, L. O. Howard. Met & Chem Eng 13:681-2 O 1 '15
Reverberatory smelting practice of Nevada consolidated copper co. Met & Chem Eng 13:681-2 O 1 '15
Reverberatory smelting practice of Nevada consolidated copper co. Met & Chem Eng 13:681-2 O 1 '15

consolidated copper co. Met & Chem Eng 13: 681-2 O 1 '15
Reverberatory smelting practice of Nevada consolidated copper co. R. E. H. Pomeroy. diags plan Am Inst Min E Bul 98:445-53 F '15; Abstract. Met & Chem Eng 13:252-4 Ap '15

'15'
Roasting and leaching concentrator slimes tailings. L. Addicks. il flow sheet Am Inst Min E Bul 104:1471-84 Ag '15; Same. Met & Chem Eng 13:531-5 S 1 '15; Discussion. Am Inst Min E Bul 108:2460-4 D '15'
Salida smelter. F. D. Weeks. Am Inst Min E Bul 104:1691-5 Ag '15'
Shaft-rockhouse practice in the copper country. L. H. Goodwin. il diags Eng & Min J 99:1061-6, 1107-10; 100:7-12, 53-7 Je 19-Jl 10 '15'

Smelting at Panulcillo, Chile. il Eng & Min J 100:787-9 N 13 '15 Smelting of copper ores in the electric fur-nace. D. A. Lyon and R. M. Keeney. diags U S Bur Mines Bul 81:1-76 '15; Conclusion. Sci Am S 80:139 Ag 28 '15

Solution control in ferric-chloride leaching of sulphide copper ores. F. N. Flynn and R. H. Hatchett. Met & Chem Eng 13:291 My '15

Solution stratification as an aid in the purification of electrolytes. F. R. Pyne. diag Met & Chem Eng 13:895-6 D 1 '15

an Arsdale's method of copper-ore treat-ment. Eng & Min J 100:61-2 Jl 10 '15

Weidlein's copper process. Met & Chem Eng 13:652 O 1 '15

Copper mines and mining Cloncurry copper district, Queensland, W. H. Corbould, diags Am Inst Min E Bul 97:83-92

Copper Creek district of Arizona. C. Hafer. il Eng & Min J 98:1145 D 26 '14

Copper discovery in Norway. A. D. Udhany. Eng & Min J 99:322 F 13 '15

Corocoro copper district of Bolivia. F Sundt. Eng & Min J 99:189-90 Ja 23 '15 Drilling campaign of the Consolidated coppermines co. plan Eng & Min J 99:1069-71 Je 19 '15

Copper mines and mining—Continued
Early history of Braden mines, Sewell, Chile.
W. Braden. il Eng & Min J 100:389-91, 3989 S 4 '15

Mining camp without a peer; revolutionary methods at Bingham, Utah. G: F: Stratton. il Sci Am S 80:241+ O 16 '15 Mining low grade copper ore by Ray Consolidated. A. N. Penny. diags Eng & Min J 99: 767-70 My 1 '15

767-70 My 1 '15

Mining methods at Braden. H. R. Graham. Eng & Min J 100:331-3 N 20 '15

Mining methods of the Arizona copper co. P. B. Scotland. diags plans Am Inst Min E Bul 98: 483-96 F '15

Starting of White Pine operations. Eng & Min J 99:623 Ap 3 '15

Table showing minimum grade of copper ore and profits. F: W. Foote. Eng & Min J 100: 882 N 27 '15

Tramming and hoisting at Copper Queen mine. G. F. G. Sherman, il diags Am Inst Min E Bul 105:1837-85 S '15

Bul 105:1837-85 S '15
Two old Appalachian copper mines. J: W.
Mason. il Eng & Min J 99:746 Ap 24 '15
Underground mining systems of Ray consolidated copper co. L. A. Blackner. il diags
Am Inst Min E Bul 102:1249-90 Je '15
Ventilation of the Copper Queen mine. C: A.
Mitke, diags Am Inst Min E Bul 105:1941-58
S '15; Discussion. 108:2477-8 D '15

Copper ores opper deposits of San Cristobal, Santo Domingo. T: F. Donnelly, bibliog il Am Inst Min E Bul 104:1759-68 Ag '15; Discussion. 108:2473-4 D '15 Copper

108:2473-4 D '15
Disseminated copper ores of Bingham Canyon,
Utah, J. J. Beeson, il diags Am Inst Min E
Bul 107:2191-2236 N '15
Economic geology of the Belgian Congo, Central Africa, S. H. Ball and M. K. Shaler, il
Econ Geol 9:617-32 O '14; Excerpts, Eng &
Min J 99:608-11 Ap 3 '15
Geology of the Burro mountains copper district, New Mexico, R. E. Somers, il maps
Am Inst Min E Bul 101:957-96 My '15; Discussion, 108:2476 D '15
Purphyry conpers P. E. Barhour, Eng & Min

Porphyry coppers, P. E. Barbour, Eng & Min J 99:1111-12 Je 26 '15

See also Chalcocite

Copper plating
Control of brass and copper plating solutions.
A. D. Cowperthwait. Metal Ind n s 13:68-9
F '15

Copper cyanide plating solutions, M. C. Weber, Metal Ind n s 13:95-6 Mr '15; Same. Met & Chem Eng 13:255-6 Ap '15; Same. Foun-dry 43:197-8 My '15; Same. Sci Am S 79:302 My 8 '15

Copper plating as used for purposes other than ornamental. E. G. Lovering. Metal Ind n s 13:458-9 N '15

Determining weight of deposit. L. C. Wilson. Metal Ind n s 13:152-4, 277-8 Ap, Jl '15

Economy and efficiency of copper cyanide. C: H. Proctor. Foundry 43:199-200 My '15

Protecting silvered mirrors by copper plating. il diag Sci Am S 79:28 Ja 9 '15

Copper salts

uprous salts of oxygen acids and a new method for preparing cuprous salts. L. C. Daniels. Am Chem Soc J 37:1167-71 My '15

Copper sulphate
New method for the preparation of copper sulphate. Eng & Min J 100:190 Jl 31 '15

Use of copper sulfate in the purification of swimming pools. S. J. Thomas. J Ind & Eng Chem 7:496-9 Je '15

Copper sulphide

Determination of cuprous and cupric sulfide in mixtures of one another. E. Posnjak. Am Chem Soc J 36:2475-9 D '14

Sulphides of copper, E. Posnjak, E. T. Allen and H. E. Merwin. Econ Geol 10:491-535 S

Copper ware

Method of retinning copper ware. H. F.

Munro. Metal Work 83:474 Mr 26 '15

Copy. See Manuscripts, Preparation of

Core making machines. See Foundry machinery

Cork

Carborundum and cork exhibits at the Panama-Pacific international exposition. il Met & Chem Eng 13:459-60 Jl '15

Corliss engines. See Steam engines

orn
Lye hulling of corn for hominy. J. W. Marden
and J. A. Montgomery. J Ind & Eng Chem
7:\$50-3 O '15
Occurrence of methyl alcohol in corn silage.
E. B. Hart and A. R. Lamb, Am Chem Soc
J 36:2114-18 O '14

Corn meal

composition of corn (maize) meal manufactured by different processes and the influence of composition on the keeping qualities.

A. L. Winton, W. C. Burnet and J. H. Bornmann. U S Agric Bul 215:1-31 '15

Corn products

Contributions of the chemist to the corn products industry. E. T. Bedford, J Ind & Eng Chem 7:275-6 Ap '15

Corncribs

Concrete block corncrib. il Concrete Cem 7:

Cornell university, Sibley college
Beginnings of Sibley college at Cornell, A. D.
White, Sibley J 29:300-14 Je '15
Growth of the Sibley college curriculum since
1868. H. Diederichs, Sibley J 29:331-42 Je
'15

Cornices

Cantilever-frame cornice, il diag Eng N 74: 1061 D 2 '15 Ornamental tile in cornice work, il Bldg Age

37:39-41 Je

Comparison of calculated and measured corona loss curves. F. W. Peek, jr. Am Inst E E Pro 34:169-76 F '15; Discussion. 34:2620-1 N '15 Electric strength of air. J. B. Whitehead. Am Inst E E Pro 34:853-65 My '15; Discussion. 34:2997-3005 D '15 Investigation of the corona in air at continuous potentials and at pressures lower than atmospheric; abstract. D. MacKenzie. Elec W 65:1303 My 22 '15 Law of corona and spark-over in oil. F. W. Peek, jr. Gen Elec R 18:821-7 Ag '15

Corporation law

Corporations and trading associations France. A. J. Wolfe and E. M. Borch U S Bur For & Dom Com 97:69-84 '15

See also Commercial law; Municipal law; Public service corporations—Law; Railroad law; Trusts, Industrial

Corporation schools

orporation schools
Apprentice school. A. W. Soderberg. Iron Tr
R 56:1169-70 Je 10 '15
Cleveland-Cliffs mining school. Iron Age 96:
978 O 28 '15
Individual and corporate development of industry. C: P. Steinmetz. Gen Elec R 18:81316 Ag '15

Modern railway school, il plans Elec Ry J 46: 341-53 Ag 28 '15

Modern railway school: It plans Elect by 5 43.

Teaching the business to the employee. Elec
W 66:291-3 Ag 7 '15

Training men for the central-station industry.
Il Elec W 66:962-4, 1142-4 O 30, N 20 '15

Works apprentice school discontinued. Iron
Age 95:1334-5 Je 17 '15

Works school for salesmen. C. R. Sturtevant.
Iron Age 95:1353 Je 17 '15

Corporation schools, National association of See National association of corporation schools

Corporations Cumulative voting. Elec Ry J 46:870-1 O 23

Individual and corporate development of in-dustry. C: P. Steinmetz. Gen Elec R 18: 813-16 Ag '15

a pitfall. J. R. Smith. Eng Small corporation—a M 49:672-8 Ag '15

See also Franchises; Holding companies; Public service corporations

Accounting

Bonus capital stock and bonds, W: P. Hilton, J Account 19:425-36 Je '15

Corporations—Accounting—Continued Issuance of securities in New Account 19:212-15 Mr '15 York.

### Finance

Overissuing capital stock. J Account 19:62-5 Ja '15

Corpulence

Machine that takes off fat. il Sci Am 112: 366 Ap 17 '15

Correspondence schools and courses Teaching foundry practice by mail. il Foundry 43:65-8 F '15

Corrosion, Electrolytic. See Electrolytic corrosion

Corrosion and anti-corrosives

orrosion and anti-corrosives

Acid-resisting alloy to replace platinum in the construction of a bomb calorimeter. S. W. Parr. il Am Chem Soc J 37:2515-22 N '15

Apparatus for making accelerated comparative durability tests of small pipe. il Eng & Contr 43:582 Je 30 '15; Eng N 74:25 Jl 1 '15

Care and maintenance of gas holders. J. H. Braine. il Am Gas Inst Pro 9:pt 1, 764-96 '14; Same cond. Am Gas Light J 101:355-9 D 7 '14

Chemical principles is the result of the property of the state of the s

7 '14
Chemical principles in the protection of iron against rust, Automobile 32:312+ My 6 '15
Corrodibility of cast iron and steel. J. N. Friend and C. W. Marshall. Iron Age 95: 1114-15 My 20 '15
Corrosion of condenser tubes. E. Bate. Gen Elec R 17:882-90 S '14; Abstract. Met & Chem Eng 12:656-7 O '14; Abstract. Ind Eng 14:413-14 O '14

Corrosion of condenser tubes. Power 41:355 Mr

9 '15
Corrosion of iron. L. C. Wilson. Eng M 48:517-23, 667-74, 849-58; 49:58-66, 202-10 Ja-My '15
Corrosion of iron and steel pipe. W: A. Dunkley; J. E. Noble. Power 41:584-5 Ap 27 '15
Corrosion of iron pans in zinc melting. Eng & Min J 100:478 S 18 '15
Corrosion of pure irons and steels used by U. S. reclamation service. Eng N 74:78 J1 8 '15
Corrosion of steel and coef iron and steels used Corrosion of steel and coef iron and steels used by '15

Corrosion of steel and cast iron compared.
R. C. McWane and H. Y. Carson, il Foundry
43:467-9 N '15
Corrosion of steel wharves at Kowloon: abstract, S. H. Ellis, diags Am Soc M E J 37:
123-4 F '15
Corrosion control of the control of the correspondence of the control of the

Corrosion problem before the American iron and steel institute. Met & Chem Eng 13:420

Deterioration of steel bridges over railway tracks at Buffalo. R. J. Reidpath. il diags Eng N 73:1144-7 Je 10 '15

Eng N 73:1144-7 Je 10 '15

Developing an acid-resisting alloy. S. W. Parr, il Iron Tr R 57:991+ N 18 '15; Same. Metal Ind n s 13:457-8 N '15; Abstract. Am Soc M E J 37:656-7 N '15: Abstract. Met & Chem Eng 13:973 D 15 '15

Effect of various elements in steel on its resistance to corrosion. A. S. Cushman. Eng & Contr 44:64-5 Jl 28 '15

Effects of pickling upon the corrosion of iron. E. A. Richardson. Met & Chem Eng 12:759 D '14; Same. Iron Age 95:621 Mr 18 '15

External corrosion of cast iron pipe; abstracts. M. R. Pugh. Munic J 37:424-5 S 24 '14; Am Soc M E J 36:0199 O '14; Eng & Contr 42: 377-81 O 21 '14; Am Gas Light J 103:65-70 Ag 2 '15

Influence of different elements on the corrosion of different elements on the corrosion.

Influence of different elements on the corrosion of iron, L. C. Wilson, Eng M 50:78-86

sion of Iron, L. C. O'15.
O'15.
Old steel of razed building examined for rust.
Eng Rec 72:223-4 Ag 21 '15.
Protection of metal structures; with discussion F: H. Fay, il diags Eng Soc W Pa 31: 115-93 Mr '15.

rotection of metals against electr weathering, chemical fumes, etc. M. il Sibley J 30:54-5 N '15 Protection

il Sibley J 30:54-5 N '15

Recent progress in corrosion resistance. D. M.

Buck. il Iron Age 95:1231-4 Je 3 '15; Same.

Eng & Contr 43:574-6 Je 30 '15; Same. Iron

Tr R 56:1155-8 Je 10 '15; Same. Metal Work

\$3:879-82 Je 18 '15; Excerpt (Copper steel

for resisting corrosion) Eng M 49:762-3 Ag

'15; Discussion. A. S. Cushman and others.

Iron Age 95:1234-9 Je 3 '15; Same. Iron Tr R

56:1159-634 Je 10 '15; Same abr. Metal Work

83:882-3 Je 18 '15

Removal of rust by chemicals. Eng & Min J 100:73-4 JI 10 '15
Rust removal by chemical reagents. J. N. Friend and C. W. Marshall. Iron Tr R 56: 1023-4 My 20 '15
Why iron and steel corrodes. J. Aston. Iron Tr R 56:423-6 F 25 '15
Wrought-iron or steel pipes? L. C. Wilson. Eng M 50:247-54 N '15

See also Boilers—Corrosion; Electrodes; Electrolytic corrosion; Metal protection; Paint; Waterproofing

Bibliography

Bibliography of metal corrosion and protection. Eng Soc W Pa 31:193-222 Mr '15

Corrugated iron

Corrugated pipe used successfully for culverts il Eng Rec 71:558 My 1 '15
Service secured from corrugated iron culverts, il Ry Age 58:316-18 F 19 '15

Corte-scope Machinery photograph display device. il Iron Age 95:1295 Je 10 15

Corundum

See also Abrasives

Cosmology Modern ideas on the end of the world. G. Jau-mann. Sci Am S 79:178-9 Mr 20 '15

Analysis of elements of cost of a complete plant unit. W. J. Huddle. Eng & Contr 44: 139-40 Ag 25 '15

See also Prices; also subdivision Cost under names of subjects

Cost accounting

ost accounting
Accounting for depreciation, J. R. Cravath,
Elec W 65:213-14 Ja 23 '15
Accounting system for roofing business, E. B.
Bourlier, Metal Work 83:39-42 Ja 1 '15
Accounts for material on engineering construction, L. H. Allen, J Account 19:352-8

My '15 All-in costs. E. T. Elbourne. Engineer 120: 101 Jl 30 '15

American foundrymen's association committee recommends universal cost keeping system. Foundry 43:451-4 N '15 Apportioning indirect production expense.

Apportioning indirect production expense.
A. M. Burroughs. Metal Work 83:284-6, 31618 F 19-26 '15
Bookkeeping and cost-keeping for electrical contractors. L:
1153-5 N 20 '15
Buildings.feetre. Buildings-factor costs. H. L. Green. Eng M 48:407-10 D '14; Same. Eng & Contr 43:101-2 F 3 '15

48:407-10 D '14; Same. Eng & Contr 43:101-2 F 3 '15
Business methods for the plumber and fitter. W. A. Fink. Dom Eng 71:185-6 My 15 '15
Contractors' cost-keeping system. Elec W 65: 797-9 Mr 27 '15
Cost accounting for fertilizer manufacturers. F. C. Belser. J Account 19:165-81 Mr '15
Cost accounting in plumbing establishments. H. G. Helstrum. Metal Work 83:53-4 Ja 1 '15
Cost accounting in sheet metal work. R: E. Mackey. Metal Work 83:314-15 F 26 '15
Cost accounting in the main works of the Westinghouse electric & manufacturing company. G. D. Piper. Elec Ry J 44:1337-40
D 19 '14
Cost accounting in the railroad repair shop. E. Cordeal. Eng M 49:211-17 My '15
Cost accounting on construction work, with a description of the system used by the Aberthaw construction Company. L. H. Allen. forms Boston Soc C E J 1:133-77 Mr '14; Discussion. 1:455-79 O '14
Cost and method. B. Daniels. See monthly

Cost and method. B. Daniels. See monthly numbers of the Inland printer

Cost keeping in the brass foundry. C. O. Skeeper. Metal Ind n s 12:497-9 D '14

Cost keeping system for work performed by municipal forces of the Philadelphia bureau of highways. Eng & Contr 43:292-4 Mr 31 '15; Same cond. Eng Rec 71:360-1 Mr 20 '15

Cost keeping system Oregon state highway commission. E. F. Ayres, Eng & Contr 44: 349-50 N 3 '15

Cost of breakage and leakage. S. Walton. J Account 19:149-52 F '15

Cost accounting—Continued
Cost of doing business. G: W. Hill. Dom Eng
71:157, 306-7 My 8, Je 12 '15
Cost of producing farm crops. O. R. Martin.
J Account 19:245-59 Ap '15
Cost system for contractor or jobber. Metal
Work 83:599-600+ Ap 23 '15
Cost system of Denver combination shop. J. R.
Elliott. Metal Work 84:274-8 Ag 27 '15
Cost system of Denver sheet metal shop. il
Metal Work 84:175-6+ Ag 6 '15
Cost system of Michigan sheet metal shop.
Metal Work 83:802-4 Je 4 '15
Cutting the costs of keeping a cost system.
A. M. Burroughs. Metal Work 83:763 My
28 '15
Depreciation, interest and manufacturing cost.

Depreciation, interest and manufacturing cost.

28 '15
Depreciation, interest and manufacturing cost.
W. C. Wright, J Account 20:361-4 N '15
Development of a unit cost system. N. Cunliff,
il Assn Eng Soc J 53:374-85 Ag '14; Same.
Eng & Contr 42:374-6 O 21 '14; Discussion.
Assn Eng Soc J 53:85-101, 165-70 Ag-S '14
Do you estimate or guess in bidding? E. Stern.
Metal Work 83:44-5 Ja 1 '15
Doing business on low overhead expense;
W. B. Perry electric company, of Brooklyn.
Elec W 65:544-6 F 27 '15
Estimating the cost of wool goods in English
mills. Textile World 49:419-24 Jl '15
Factory cost accounting. M. McKune. Metal
Ind n s 13:286-7 Jl '15
Figuring cost on labor percentage basis. Metal
Work 83:12-13 Ja 1 '15
Final disposition of expense figures. A. M.
Burroughs. Metal Work 83:471-2 Mr 26 '15
Finding costs in the steel foundry. G. Muntz.
Iron Tr R 57:482-4 S 9 '15
Guide posts in the contracting business. J. C.
Walker. Metal Work 83:607-9 Ap 23 '15
Handling material and perpetual inventory.
A. M. Burroughs. Metal Work 83:153-4 Ja 22
'15
How the contractor can know where he stands.
L. W Movey ir Elec W 66:870-2 O 16 '15

A. M. Burroughs. Metal Work 83:153-4 Ja 22
'15
How the contractor can know where he stands.
L: W. Moxey, jr. Elec W 66:870-3 O 16 '15
How to estimate cost and keep accounts. J. P.
Coghlin. Elec W 66:818 O 9 '15
How to use statistics in management. F. G.
Coburn. Eng M 49:720-3 Ag '15
Jobbing machine shop cost system. il Iron Age
96:863-5 O 14 '15
Keeping a line on daily expense. A. J. Gibney.
Ry R 57:468-70 O 9 '15
Keeping accurate daily and total cost sheets
will pay the contractor. C. B. Montgomery.
Eng Rec 71:535-6 Ap 24 '15
Keeping cost in a job plating shop. H. J. Ter
Doest. Metal Ind n s 13:189 My '15
Keeping cost in interior construction. L: W.
Moxey, jr. Elec W 66:924-7 O 23 '15
Machine accounting in a pump works; Hollerith tabulating system. S. G. Koon. il Iron
Age 96:408-11 Ag 19 '15
Making the cost department worth while.
W: Kent. Ind Eng 14:293-5 O '14
Manufacturing expense distribution. N: T.
Ficker. Eng M 49:321-6, 553-9, 690-7, 862-71;
50:58-64, 254-61, 390-400 Je-D '15
Measurement of efficiency. H. L. Gantt. Iron
Tr R 55:1131-3 D 17 '14; Same. Ind Eng 14:
463-5 D '14; Same. Iron Age 94:1320-1 D 3
'14; Same. Automobile 31:1104-5 D 17 '14;
Same cond. Ry Age (Mech ed) 89:249-51 My
'15; Same cond. Metal Work 83:725-6 My 21
'15; Same cond. Metal Work 83:725-6 My 21
'15; Same cond. Metal Work 83:75-6 My 21
'15; Same cond. Metal Work 83:75-6 My 21
'15; Same cond. Metal Work 83:75-6 My 21
'15; Same cond. Metal Work 83:75-78 Ja '15; Abstract; with discussion. Am Soc M E J 37:
11-13 Ja '15 stract; w

1914 operations of the Philadelphia bureau of highways and street cleaning. il Good Roads n s 9:131-5 Ap 3 '15

Overburdening the overhead expense. Whitehead. Dom Eng 72:317-18 S 11 '15

ractical cost system for combination sh Metal Work 84:306, 340+, 361+ S 3-17 Practical

Relation between production and costs. H. L. Gantt. Am Soc M E J 37:466-8 Ag '15; Same. Am Gas Light J 103:54-5 Jl 26 '15; Same. Iron Age 96:16-18 Jl 1 '15; Same. Iron Tr R 57:267-8+ Ag 5 '15; Same. Mach 21:1000-2 Ag '15; Same. Textile World 49:510-13 Ag '15; Discussion. Am Soc M E J 37:468-75 Ag '15; Discussion. Am Soc M E J 37:468-75 Ag Jl 1 '15

Road-maintenance costkeeping in Pennsylvania. Eng N 74:250-3 Ag 5 '15

Uniform basis for figuring foundry costs. Iron Age 96:1118-21 N 11 '15
Unit construction costs from the new smelter of the Arizona copper co., ltd. E. H. Jones. diags Am Inst Min E Bul 91:1497-1649 Jl '14; Abstract. Eng & Contr 42:560-3 D 16 '14
Unit costs for day before obtained on this job by 8:30 A. M. Eng Rec 71:785-6 Je 19 '15
Value of published costs. W. K. Palmer. Elec Ry J 45:845-6 My 1 '15
What is the cost per thousand? B. Daniels, Inland Ptr 54:393-6 D '14

See also Accounting; Overhead expense

### Costume

See also Automobile costumes; Hosiery

Cottages

Attractive English cottage, diag plan Bldg Age

ottages
Attractive English cottage, diag plan Bldg Age
37:59 Ap '15
Cottage of the semi-bungalow type, il diags
plans Bldg Age 37:49-52 Ja '15 tage—built in
Riverside, Cal., for \$3,000. R. R. Newman, il
plans Concrete Cem 6:20-1 Ja '15
Five-room stucco finished cottage, il plans
Bldg Age 37:42-5 O '15
Low cost cottage with shingle roof intended
for erection on a lot having forty feet frontage, il diags plans Bldg Age 37:42-5 S '15
New Jersey cottage of neat design, il plans
Bldg Age 37:27-9 Ap '15
Suburban house with tex-tile walls, il diags
plans Bldg Age 37:42-5 Ap '15
Tile cottage with shingle roof, C: E. Anderson, il plans Bldg Age 37:19-24 O '15
See also Architecture, Domestic; Bunga-

See also Architecture, Domestic; Bungalows; Country houses

Chemical engineering in nitrocellulose manufacture. S. L. Stadelman, Met & Chem Eng 13:361-6 Je '15

13:361-6 Je '15
Chinese cotton industry. R. A. Morgan. Textile
World 50:187-9 N '15
Further results of moisture tests on American
cotton at the Havre conditioning house.
D. E. Douty. Textile World 49:230-2 My '15
Methods of determining length of cotton staple
and illustrations of their application. N. A.
Cobb. Textile World 49:613-16 S '15
Moisture in cotton. Textile World 48:405-6 Ja
'15

Use of cotton for the production of explosives. Sci Am S 80:271 O 23 '15 Sec also Cotton mills; Dyes and dyeing;

Dyes and dyeing; Textile industry and fabrics

Cotton, Absorbent

Machines for preparing absorbent cotton, il Textile World 48:350-1 D '14 Preparing absorbent cotton, il Textile World 48:533-5 F '15

Cotton, Absorbent, Substitutes for Continental substitutes for absorbent cotton. Textile World 50:74-5 O '15

Cotton as contraband of war Cotton as contraband. Textile World 49:587-9

Greatest technical blunder of the war. Sci Am 113:176 Ag 28 '15 War significance of cotton. Sci Am 113:38 JI 10 '15

Cotton carding
Experience in a cotton card room. Textile
World 49:661-2 S '15

Cotton fabrics

otton fabrics
Breaking strength of cotton cloth. D. E.
Douty. Textile World 49:171-2 My '15
Cotton fabrics for aeroplanes and dirigibles.
Textile World 49:225 Je '15
Faulty fabrics as viewed by the laundryman.
W. H. Johnstone. Sci Am S 80:359 D 4 '15

Novelties in cotton fabrics. il Textile World 49:76-7, 342-6 Ap, Je '15

Putting up goods to suit buyers. Textile World 48:630-1 Mr '15

Cotton fibers

Length of the cotton staple. Textile World 50: 155-6 N '15

Cotton handling Bale conveyor in a cotton warehouse at Galveston, Tex. J: R. Fordyce. il Eng N 73:718-19 Ap 15 '15

Cotton handling—Continued
Concrete warehouses and terminal plant at
New Orleans will cover 100 acres. il plan
Eng Rec 71:402-3 Mr 27 '15
Cotton warehouse and terminal at New Orleans. diag Eng N 73:1217 Je 24 '15
Handling cotton with electric freight trucks
at Galveston. il Int Marine Eng 20:103-4 Mr
'15

Cotton machinery
Ball bearings for cotton mills. E. A. Allen. il
Textile World 49:631-8 S '15
Electricity in cotton gins. J. H. Moseley. il
Elec R & W Elec'n 67:139-45 Jl 24 '15
Machines for preparing absorbent cotton. il
Textile World 48:350-1 D '14
Preparing absorbent cotton. il Textile World
48:533-5 F '15

Cotton manufacture

Cotton manufacture Cotton manufacturing in China. R. A. Morgan. Textile World 49:412-13; 50:85-8 Jl. O '15 Utilization of cotton waste by German and Austrian methods. F. Nasmith. Textile World 49:sup251+ My '15

Cotton manufacturers, National association of. See National association of cotton manufacturers

Cotton mills

otton mills
Cotton spinning and weaving mill, diag Textile
World 49:436-9 Jl '15
Electricity in cotton duck mills, il Elec R &
W Elec'n 66:673-9 Ap 10 '15
General business efficiency in connection with
cotton mill management. J. T. Rose. Textile
World 49:190-3 My '15
Hyperalitation, millywork in Greenshore, N. C.

World 49:190-3 My '15
Humanitarian millwork in Greensboro, N. C.
G. Dawe, il Am Ind 15:16-17 My '15
Meeting of the Southern textile association;
president's address. W. M. Sherard. Textile
World 50:162-4 N '15
Piece rate system for wages in cotton mills.
O. Elsas. Textile World 49:213-17 My '15
Prevention of accidents in cotton mills. J: Calder. Textile World 49:622-4 S '15
Salem cotton mill to use central-station power.
il Elec R & W Elec'n 67:511 S 18 '15
Uses for concrete construction by cotton manufacturers. L. C. Wason, Textile World 49:288-91 My '15
cotton pulp

Cotton pulp Pulp from cotton stalks. Sci Am 113:482 D 4

Cotton sizing

Sizing of warp yarns, C. C. Moore, Textile World 49:323-5 Je '15

Cotton spinning

Apparatus for steaming cotton roving, diags Textile World 49:97 Ap '15 Machinery required for spinning cotton yarn. Textile World 49:668-9 S '15 Spinning fine yarn. Textile World 48:504-5 F

Cotton stalks. See Cotton pulp

Cotton tariff

otton tariff
Regulating temperature and humidity in appraising cotton goods. il diag plan Textile
World 48:380-2 Ja '15
Science and the tariff; apparatus employed in
determining customs duties. E. E. Pickrell.
il Sci Am S 79:199 Mr 27 '15

Cotton trade

ddress to National association of cotton manufacturers. A. G. Duncan, Textile World 49:199-202 My '15 Address

49:199-202 My '15 Address to the members of the American ton manufacturers association. T. I. I man. Textile World 49:182-5 My '15 I. Hick-

Cotton reserves. Textile World 48:277-8 D '14

Cotton textiles in Argentina. Textile World 49:318-21, 414-17 Je-Jl '15
Italian cotton industry since the European war. R. Sansone. Textile World 49:501-3 Ag '15

Limitations on association activities in developing export trade, P. T. Cherington.
Textile World 49:217-19 My '15

Marketing cotton goods in India. Textile World 48:374-6 Ja '15

Scientific solution of the world's cotton prob-lem. L. Johnson. Sci Am 113:297+ O 2 '15

Trade abuses and a remedy; need of organization. K. R. Hooker. Textile World 49:193-7 My '15

Cotton waste

Cotton waste bleaching, il Textile World 48: 326-7 D '14 Utilization of cotton waste by German and Austrian methods. F. Nasmith. Textile World 49:sup251+ My '15

Cotton weaving
Scientific management in a cotton weave room,
Textile World 49:526-8 Ag '15

Cottonseed

Cottonseed industry in foreign countries, T: H. Norton, pl U S Bur For & Dom Com 99:1-73

Heating of cottonseed—its causes and prevention. E. H. R. Barrow. J Ind & Eng Chem 7:709-12 Ag '15
Nitrogen and fat in short staple cottonseed. C. A. Wells and F. H. Smith. J Ind & Eng Chem 7:217 Mr '15
Pressure of cottonseed. W. M. Eliot. Eng N 74:991-2 N 18 '15

Cottonseed meal

Ottonseed meal
Determination of lint in cottonseed-meal. R. N.
Brackett. J Ind & Eng Chem 7:611-12 Jl '15
Official method for determining crude fiber as applied to cottonseed meal. C. K. Francis. il J Ind & Eng Chem 7:676-80 Ag '15
Preparation of raffinose. C. S. Hudson and T. S. Harding. Am Chem Soc J 36:2110-14 O '14

Cottonseed oil Contributions of the chemist to the cottonseed oil industry. D: Wesson. J Ind & Eng Chem 7:276-7 Ap '15; Abstract. Met & Chem Eng 13:283-4 My '15

Cottonseed oil mills
Electric drive in a cottonseed-oil mill. J. W.
Ruff. Elec W 66:978-9 O 30 '15

Cottrell, Frederick Gardner, 1877-Dinner to Frederick G. Cottrell, por Met & Chem Eng 13:81-4 F '15

Cottrell process. See Electric precipitation Coulometer. See Voltameters

Coumarin of Wichmann's method for the Modification

detection of small amounts of coumarin, par-ticularly in factitious vanilla extracts. J. R. Dean. J Ind & Eng Chem 7:519 Je '15 Council Bluffs, Iowa

Water supply

Council Bluffs waterworks regeneration reverses slump in population curve, il diag Eng Rec 72:286-7 S 4 '15

Council Grove, Kansas

Water supply

Water supply treatment at Council Grove. L: L. Tribus, il diags Am Water Works Assn J 2:83-102 Mr '15

Country clubs

Country-club houses, H. D. Eberlein, il plans Arch Rec 38:206-27 Ag '15

Arch Rec 38:206-27 Ag '15

Country houses
Architect's country house: residence of Electus
Litchfield, New Canaan, Conn. H. T. Bottomley. il diags Arch Rec 37:48-63 Ja '15
Country house architecture in the East. E. D.
Litchfield. il plans Arch Rec 38:452-88 O '15
Country house architecture in the middle
West. P: B. Wight. il plans Arch Rec 38:385421 O '15
Country house architecture on the Pacific
coast. L: C. Mullgardt. il plans Arch Rec
38:423-51 O '15
Country house with clapboard walls. il diags

38:423-51 O '15
Country house with clapboard walls, il diags plans Bldg Age 37:42-5 Ja '15
Electricity on a country estate, il Elec W 66:
476-8 Ag 28 '15
Illumination of the suburban house; the use of electricity or acetylene, H. L. Alt. il diags Brickb 24:248-52 O '15
Modern version of the early Pennsylvania country house, C. M. Price, il plans Arch Rec 37:76-81 Ja '15

Residence of Charles S. Walton, Esq. R. Murray, il plans Arch Rec 38:501-23 N '1

Country houses - Continued

Seashore cottage at Nantucket, il Arch Rec 37:479-80 My '15

ypical country plumbing installation plans Bldg Age 37:57-60 Jl; 61-4 Ag '15 Typical installations.

Sec also Bungalows buildings; Farmhouses Bungalows; Cottages; Farm

Couplers. See Car couplings

Couplings

Bull dog shaft couplings. il Power 42:55 Jl 13

Flexible coupling, il diag Engineer 119:608 Je

18 '15 Flexible couplings. H: Davey. diags Engineer 120:107 J1 30 '15 Lining up small turbine sets. J. H. Hurley. diags Power 41:714-15 My 25 '15 Quarter-turn rod coupling. il diag Power 41:

See also Car couplings; Hose couplings; Joints

Court houses

117 Ja 26 '15

Delaware county court house; views and plans. Arch & Bldg 47:330b-335 S '15

Court rooms

Relation of light to the proof of documents: proper illumination of courts necessary to insure justice, A. S. Osborn, Sci Am S 78: 250-1 O 17.'14; Same, Illum Eng Soc 9:998-1006; Discussion, 9:1006-10 no 9'14

Courtesy

Courteous service. E: H. Mulligan. Elec R & W Elec'n 67:227-8 Ag 7 '15 Courtesy in business offices. Iron Age 95:195 Ja 21 '15

Ja 21 '15 Courtesy in timekeeping. N. Hutchings. Iron Age 96:581 S 9 '15 Importance of personal touch. N. Hutchings. Iron Tr R 57:751 O 14 '15 Making courtesy work for you. Horseless Age 34:313-14 Ag 26 '14 Personal element in the plumbing business. G. D. Crain, jr. Dom Eng 73:75-6 O 16 '15

Occurrence of covellite at Butte, Mont. A. P.
Thompson. il Am Inst Min E Bul 100:645-77
Ap '15; Discussion. 108:2464-71 D '15
Sulphides of copper. E. Posnjak, E. T. Allen
and H. E. Merwin. Econ Geol 10:527-32 S '15

Cover pages

Borders about cover-designs. J. L. Frazier.
Inland Ptr 55:69-72 Ap '15

Crane hooks

Crane hooks for lifting sheet metal. diags Mach 22:230 N '15

Cranes, derricks, etc.

Builder's mast crane which proved a success. il Eng N 73:938 My 13 '15 Cranes for the machine shop and foundry. H. M. Lane. diags Iron Age 96:246-8 Jl 29

Cylinder-head davit crane. F. W. Salmon. diag

Power 42:481-2 O 5 '15
Derrick mounted on traveling cranes for mill erection at Thane, Alaska. il Eng N 73:127
Ja 21 '15

Derrick-trolley carries dirt beyond caving banks, M. A. Milliff, diags Eng Rec 72:674 N 27 '15

Efficient traveling derrick, il diag Eng N 74: 506 S 9 '15

Electric crane facilities unloading wagons. il Elec W 66:147-8 Jl 17'15

Electric hatchway control gear for cranes. il diags Engineer 119:476-7 My 14 '15

Electric steam tunnel crane il Eng & Contr 43:184 F 24 '15; Elec Ry J 45:427-8 F 27 '15; Iron Age 95:451 F 25 '15; Ry Age 58:369-70 F 26 '15; Ry R 56:280-1 F 27 '15; Sci Am S 79:285 My 1 '15

Electrical construction in machine shops and foundries. N. G. Meade. diags Elec R & W Elec'n 67:16-18 Jl 3 '15

Erection traveler, new Quebec bridge. H. Borden. il plans Eng N 73:417-22 Mr 4 '15

Giant German and Austrian cranes required in navy yards for placing turrets, guns and machinery. F. C. Perkins. il Sci Am S 80: 145, 148 S 4 '15

Handling materials in manufacturing plants. R. L. Streeter. il diags Eng M 50:222-46, 401-28 N-D '15

28 N-D T<sub>3</sub> Laying rail with the help of locomotive cranes. il Ry Age 59:353-4 Ag 20 '15 Light traveler cheapens sheeting of trench across river. W. H. Brotherton. plan Eng Rec 71:439 Ap 3 '15 Locomotive

ocomotive crane of heavy construction. il Iron Age 94:1488 D 31 '14

Locomotive cranes; committee report, il Ry R 57:519-22 O 23 '15; Same cond. Ry Age 59: 753-4 O 22 '15

57:519-22 O 23 '15; Same cond. Ry Age 59: 753-4 O 22 '15
Locomotive cranes for France, il Iron Age 96: 980-1 O 28 '15
Long 15-ton guy derrick folds into compact form, diags Eng Rec 72:532-3 O 30 '15
Long span coal-handling gantry crane, il Iron Age 96:236 Jl 29 '15
Machinery hall cranes, Panama exposition, il Iron Age 96:236 Jl 29 '15
Machinery hall cranes, Panama exposition, il Iron Age 94:1333 D 10 '14
New 150-ton revolving floating crane for Norfolk, A. F. Case, diag Eng N 73:1164-5 Je 17 '15; Abstract, Eng M 49:738 Ag '15
Panama crane contract, F. H. Cooke, il diags Eng N 73:913-17 My 13 '15
Portable derrick for handling transformers, il Elec W 66:1091-2 N '13 '15
Portable derrick for installation on motor trucks. Concrete Cem 6:108 F '15
Porposed gantry crane for car repair yards, W. E. Johnston, plant Ry Age (Mech ed) 89: 304 Je '15
Special type of slag handling crane, il Iron

Special type of slag handling crane, il Iron Age 95:939 Ap 29 '15 Standardization of chilled iron crane wheels; abstracts. F. K. Vial. diags Am Soc M E J 37:147-51 Mr '15; Iron Tr R 55:1083-7+ D 10

Standardization

'14' andardization of crane motors. Ry Age (Mech ed) 89:585 N '15' raction wheel locomotive crane, il Eng & Contr 44:55 Jl 21 '15 se of locomotive cranes and some data on their cort of provision representation. Traction

their cost of operation. Eng & Contr 44:414-16 N 24 '15 Use of wrecking crane saved money on small job. R. C. Hardman, il Eng Rec 72:366 S 18

Uses of the locomotive crane in electric railway work. G. J. Kuhrts. il Elec Ry J 46: 877-8 O 23 '15 Uses of

ses of the locomotive crane in railway service. il Ry Age 59:110-15 Jl 16 '15

See also Crane hooks; Hoisting machinery

## Accidents

Crane and chain accidents: abstract. Ind Eng 14:411-12 O '14 Making the operation of the overhead crane safe. Ind Eng 14:434-8 N '14

Failures

Failure of Panama crane Ajax. F. H. Cooke, il diags Eng N 73:918-23 My 13 '15; Abstract. Eng M 49:584-7 Jl '15

Failure of the great German crane of the Panama canal. Eng N 73:947-8 My 13 '15 How a German crane failed, il Iron Tr R 56:

274-6 F 4'15 Stresses in the Panama canal cranes. Eng N 74:86-8 J1 8 '15

Safety devices

Derrick dangers. Eng & Min J 99:904 My 22

Fifty safety rules for the operation of cranes. Foundry 43:16-17 Ja '15; Same. Eng & Min J 99:779-80 My 1 '15

J 93:173-80 My 1 '15 Making the operation of the overhead crane safe. Ind Eng 14:434-8 N '14 Rules for cranemen. Am Ind 16:28-9 Ag '15 Safeguarding cranes, Iron Age 95:403 F 18 '15 Safeguarding of cranes, il Am Ind 16:sup1-4 N '15

Safety in crane chains. E. B. Morgan. Iron Age 96:1116-17 N 11 '15

Crankpins

Crankpin failure, F. F. Jorgensen, il diags Power 41:720-1 My 25 '15

Crankpin troubles. C. W. Haynes. Power 41: 120-1 Ja 26 '15

Crankshafts

Alignment of outer bearings. J. Reid. il Power

42:126-7 N 23 '15 Broken crankshafts. A. V. Clarke. diag Power 42:385 S 14 '15 Crankshaft for two-cycle internal combustion engines. D. O. Barrett. Mach 21:118-20 O '14; Abstract. Ind Eng 14:441 N '14 Ford methods and the Ford shops. H. L. Ar-nold. il Eng M 48:704-11 F '15 Problems of eight-cylinder engine design. O: M. Burkhardt. diags. Horseless. Age 36:226-

M. Burkhardt. diags Horseless Age 36:276-

8 8 15 '15
Types of automobile crankshaft lathes, J. C. Spence, Mach 21:569 Mr '15
Types of automobile crankshaft lathes: universal machines for the crankshaft manufacturer and special equipments for the automobile builder, W: O. Strauss, il diags Mach 21:400-3 Ja '15

Craven, Alfred, 1846-Sketch, por Eng M 50:214-15 N '15

Cream of tartar

Manufacture of cream tartar, O: Best. Met & Chem Eng 13:613-17 S 15 '15

Creameries

ummary of the results of experiments on the purification of creamery refuse and their application. H. R. Crohurst and A. D. Wes-ton. Eng & Contr 44:7-9 Jl 7 '15

Creatinine

Observations of the excretion of creatinine by women. M. Hull. Am Chem Soc J 36:2146-51

Credit

redit
Association and the slow pay customer. E. J.
Buckley. Metal Work 82:745 D 4 '14
Banking and credit in Argentina, Brazil, Chile,
and Peru. E: N. Hurley. U S Bur For &
Dom Com 90:1-72 '14
Business hints for the dealer and contractor.
G. D. Crain, jr. Elec R & W Elec'n 67:475-6
S 11 '15
Credit continue C: E. Moole, J. Account 18:497

Credit granting. C: E. Meek. J Account 18:427-34 D '14

Credit problems of tool builders. Iron Tr R 56:647 Ap 1 '15 Credit 57.5. The following for plumbers and fitters. W. A. Fink. Dom Eng 73:9-10, 169-70, 297 O 2, N 6, Fink. D

Creditor who stands for his rights. E. J. Buck-

Creditor who stands for his rights. E. J. Buck-ley. Metal Work 84:623 N 12 '15 Credits, collections and cash discounts. W. H. Vilett. Elec R & W Elec'n 67:106-7 Jl 17 '15 Credits from the viewpoint of a certified pub-lic accountant. F: H. Hurdman. J Account

18:435-54 D '14 Established credit prevents failures. F. R. Cline. Metal Work 83:436-7 Mr 19 '15 Financial statements as a basis of credit. J. E: Masters. J Account 19:334-43 My '15 Putting collections on a banking basis. T. M. Cadey. Metal Work 84:548-9 O 29 '15

Reciprocal credit system for supply houses. J. B. Chambers. Metal Work 84:426-7+ O 1

See also Banks and banking; Trade acceptances

Creosote

Application of the Davis spot test in the preliminary examination of creosotes. I key, il J Ind & Eng Chem 7:923-4 N

Carbolineum and creosote. H. H. Alcock. Gas Light J 103:58-9, 125 Jl 26, Ag 23 '15

Carbolineum and creosote. S. R. Church. Am Gas Light J 103:108 Ag 16 '15

Effect of the war on timber preservation. Ry Age 58:843-5 Ap 16 '15

Mixing tar with creosote, P. C. Reilly, Ry R 56:242-7 F 20 '15

Only creosote properly applied withstands teredo. Eng Rec 71:209-10 F 13 '15

Specification for a coal-tar creosote solution. H. Von Schrenk and A. L. Kammerer. Eng Rec 71:144 Ja 30 '15; Same. Ry Age 58:160-1 Ja 22 '15

Specification for a creosote-Eng Rec 71:398 Mr 27 '15 creosote-coal tar solution.

Tests of wood preservatives, H. F. Weiss and C. H. Teesdale, il U S Agric Bul 145:1-20 '15

Toxicity of coal-tar creosote for the xylotrya. L. F. Shackell. Eng Rec 71:144 Ja 30 '15 Toxicity of creosote for marine borer. Ry Age 58:159 Ja 22 '15

Creosoting

reosoting
Creosoting of cross ties as practiced by American railroads. A. C. Steinmayer, il Assn Eng Soc J 54:110-20 Mr '15
Effect of steaming process of creosoting on strength of Oregon fir piling; abstracts, H. B. Macfarland, Eng Rec 70:487-8 O 31 '14; Eng & Contr 42:481-3 N 18 '14; Summary, Eng N 72:863 O 29 '14
How not to waste steam in creosoting plants, A. M. Lockett, Eng Rec 71:145 Ja 30 '15
Tests vs. inspection of treatment of creosoted wood paving blocks. F. W. Cherrington, Munic Eng 48:120-1 F '15

See also Wood preservation

Bleaching and finishing crepes, Textile World 49:121-2 Ap '15

Cresols

Preparation of some new substituted cresols. A. J. Hill and L; E. Graf, Am Chem Soc J 37:1839-46 Ag '15

Cribs

Shell for Wilson avenue crib floated to place. il Eng Rec 72:514 O 23 '15

Cribs, Concrete

ribs, Concrete
Concrete crib with precast members. diags
Eng N 73:905 My 6 '15
Concrete cribs used successfully in dock construction at Victoria. il diags plans Eng Rec 72:165-7 Ag 7 '15
Concrete units for crib construction. M. D. Campbell. il Ry Age 58:476-7 Mr 12 '15
Large reinforced-concrete cribs used for Welland ship canal entrance. R. P. Johnson. il diags Eng Rec 71:458-60 Ap 10 '15
Reinforced-concrete floating caissons for the Welland ship canal. il diags Eng N 73:1122-4 Je 10 '15
ribs. Intake

Cribs, Intake
Placing the Milwaukee waterworks intake crib.
R. E. Stoelting. il diag Eng N 73:1058-9 Je
3 '15

Rebuilding the Omaha water-intake cribs, G: T. Prince, il diags Eng N 74:342-4 Ag 19 '15

Crime and criminals

See also Convict labor; Identification

Educating invalid soldiers. A. Gradenwitz. Il Sci Am 113:229 S 11 '15 Motion study for the crippled soldier. F. B. Gilbreth. il Am Soc M E J 37:669-73; Discus-sion. 37:673-5 D '15

Training of the war's maimed, halt and blind. il Sci Am 113:401+ N 6 '15

Critical point

Determination of critical points in iron, steel and alloys, il diags Met & Chem Eng 13:643-4 S 15 '15

Electrical resistance and critical ranges of pure iron, G. K. Burgess and I. N. Kellberg, U S Bur Stand Bul 11:457-70 My 10 '15

Locating the critical range with the Brinell ball tester. J. G. Ayers, jr. Mach 21:282 D'14

Crocker, Mrs. Emmons
Vice president of the American forestry association. L. Adams-Williams. por Am For 21:204-6 Mr '15

Crocker land expedition. Sci Am 111:489 D 12 Crocker land

Cross-ties. See Railroad ties

Croton river

Long-term variations in stream flow, Croton and Hudson rivers. E: H. Sargent. Eng N 72:1119 D 3 '14

Crucibles

Device for pouring clean metal from crucibles. il Iron Age 96:418 Ag 19'15

Her drawing crucible furnace, il Ind Eng 14: 426 N '14

Crucibles, Graphite
Crucible business. J. Bartley. Metal Ind n s 13: 14, 54-5, 107-8 Ja-Mr '15

Crucibles, Platinum
Study of the quality of platinum ware with special reference to losses on heating. G: K. Burgess and P. D. Sale, diags U S Bur Stand Bul 12:289-314 N 8 '15; Same cond. J Ind & Eng Chem 7:561-4 Jl '15

Crushed stone

Circular ircular storage system applied to stone crushing plants. diag Eng Rec 72:sup53 Ag

Crushing

Concentrating plant of the Moose Mountain, Ltd. B. B. Hood, il diag Eng & Min J 99:973-6 Je 5 '15

Crushing and grinding. L. D. Mills and M. H. Kuryla. Met & Chem Eng 13:721-2 O 15 '15 Crushing plant of the Ohio copper co.'s mill. R. S. Lewis, il diags Eng & Min J 99:748-50 Ap 24 '15 Heat developed in crushing. J. Cook. Eng & Min J 99:976-8 Je 5 '15; Abstract. Met & Chem Eng 13:190 Mr '15 Kick vs. Rittinger: an experimental investigation in rock crushing, performed at Purdue university. A. O. Gates. il diags Am Inst Min E Bul 105:2023-51 S '15 Laws of Kick and Rittinger. G. H. Stanley. Met & Chem Eng 12:783-4 D '14 Old storage used for oversize in enlarged rock-crushing plant on Detroit river. il plan Eng Rec 72:46-7 Jl 10 '15 Quincy dump and grizzlies. L. H. Goodwin. plan Eng & Min J 100:103 Jl 17 '15 Standardizing rock crushing tests. M. K. Rodgers. Am Inst Min E Bul 105:2053-5 S '15

Underground crushing and loading arrangements. A. E. Hall, diags Eng & Min J 99: 192-3 Ja 23 '15

See also Crushing machinery; Gold milling; Rockhouses; Stamp mills; Tube milling

Crushing machinery

British Portland cement making machinery. il diags Engineer 119:175-7, 198-201, 246-9, 302-4, 478-80, 552-4, 626-8; 120:4-6, 195-6 F 12-26, Mr 12, 26, My 14, Je 4, 25-Jl 2, Ag 27

Bronze ball gyratory crusher. il Munic J 38:

Fronze ball gyratory crusher. It Munic J 38: 446-7 Ap 1 '15
Cinder crushing and pulverizing mill. il Iron Age 96:242 Jl 29 '15
Effect of increased reduction on Blake-type crushers. M. W. Heller. Eng & Min J 99: 399-400 F 27 '15
Kennedy slugger type crusher. il Iron Tr R 57:27 Jl 1 '15
Largest rock breaker. Eng & Min J 99:577 Mr

Largest rock breaker. Eng & Min J 99:577 Mr

27 15

Machine for reclaiming metals, il diag Elec R & W Elec'n 67:440-1 S 2 '15

Marcy ball mill described, diag Eng & Min J 100:147 Jl 24 '15

Modern rock-crushing plant P. K. Yates, il plans Eng N 73:582-5 Mr 25 '15

New secondary rock crusher, diag Eng N 73: 1098 Je 3 '15

New types of grizzlies, il Eng & Min J 99:241-

New types of grizzlies. il Eng & Min J 99:241-2 Ja 30 '15

eclaiming metals from cinder: Standard equipment company crusher, il diag Foundry Reclaiming :327-8 Ag '15

43:327-8 Ag '15 Shaft-rockhouse practice in the copper country, L. H. Goodwin, plan Eng & Min J 100:10-11 Jl 3 '15 Standard cinder crushers, il diags Metal Ind n s 13:342-3 Ag '15

n s 13:342-3 Ag '15
Starting a large, loaded, gyratory crusher by reversing the motor. A. C. Hewitt. Elec R & W Elec'n 65:1173 D 19 '14

Successful roll operation. J. Humes. Eng & Min J 99:615-16 Ap 3 '15

Telsmith crushing plants. il Munic J 39:825-6 N 25 '15

Tendency of American milling machinery practice. J. I. Wile. Eng & Min J 99:691-4 Ap 17

See also Hardinge mill

## Cryptographs. See Ciphers

Crystallography
Chemical significance of crystalline form. W:
Barlow and W: J. Pope. il Am Chem Soc
J 36:1675-86 Ag '14

Electron theory and metallic selenium crystals. Elec W 64:1152 D 12 '14
Fractional crystallization of the picrates of the rare earths of the didymium group. L. M. Dennis and F. H. Rhodes. Am Chem Soc J 27:807-15 Ap '15
Method of reducing some metals in crystallized form on glass slips as permanent migrascape.

Method of reducing some metals in crystallized form on glass slips as permanent microscope mounts. J. H. Bowman, il Am Chem Soc J 37:1468-71 Je '15
Mixed crystals of ammonium chloride with manganese chloride. H. W. Foote and B. Saxton. Am Chem Soc J 36:1695-1704 Ag '14
Remarks concerning the chemical significance of crystalline form. T. W. Richards. Am Chem Soc J 36:1686-95 Ag '14
X-ray spectrometer for the study of the properties of crystals, diag Sci Am S 79:19 Ja 9 '15

X-rays and crystalline structure. Sibley J 2 103-6 Ja '15; Same. Sci Am S 79:82 F 6 '15 X-rays and crystalline structure. W: D Bragg. Sci Am S 79:5-7 Ja 2 '15

See also Liquid crystals

## Crystals, Liquid. See Liquid crystals Cuba

Industries and resources

Geology of the iron-ore deposits in and near Daiquiri, Cuba. J. F. Kemp. il diags map Am Inst Min E Bul 105:1801-36 S '15 Iron deposits of Daiquiri, Cuba. W. Lindgren and C. P. Ross. bibliog il Am Inst Min E Bul 106:2171-90 O '15 Mayari iron-ore deposits, Cuba. J. F. Kemp. il Am Inst Min E Bul 98:129-54; 103:1461-2 F, Jl '15

Culebra cut. See Panama canal-Culebra cut

Disappearing culm piles. il Colliery 35:648 Jl

## Cultivators. See Soil millers

Culverts

Concrete culvert pipe and concrete piles. Ry Age 59:762-3 O 22 '15
Construction of the Barge canal crossing of Oak Orchard creek, E. Low. il diags Eng N 73:430-2 Mr 4 '15
Corrugated metal culverts for roads. Metal Work 84:457 O 8 '15
Corrugated pipe used successfully for culverts. il Eng Rec 71:558 My 1 '15
Culvert with ditch connection. F. O. Nelson. diag Eng N 74:943-4 N 11 '15
Culverts damaged by extreme freshet in small creek, A. E. Steere, il Eng N 74:650-1 S 30 '15

Development in culvert construction. E: J. Whalen. Munic Eng 48:134-5 F '15 Discussion of the administrative and design

Discussion of the administrative and design features of highway bridge and culvert work. A. Marston. Eng & Contr 42:589-90 D 23 '14 Economic design of culverts for various depths of fills. P. K. Sheidler. il diags Eng & Contr 43:288-90 Mr 31 '15 Half-circle corrugated culverts for street drainage. J: C. Hiteshew. il diag Eng N 73: 270 F 11 '15

dramage. J.; C. Hitesnew. II diag Eng N 73: 270 F 11 '15
Interlocking sectional concrete culvert. il Concrete Cem 7:127 S '15
Service secured from corrugated iron culverts. il Ry Age 58:316-18 F 19 '15
Small highway culverts. J. W. Strack. il Munic Eng 48:316-17 My '15
Standard concrete culverts recommended by the Michigan highway department. diags Eng & Contr 43:44 Ja 13 '15
Standard lateral drainage culvert for St. Mary's canal, Milk river project, U. S. reclamation service. diags Eng & Contr 43: 385 Ap 28 '15
Standard small culverts recommended by the Illinois highway commission. diags Eng & Contr 42:572 D 16 '14
Tests of some large reinforced concrete culvert pipe. W. J. Schlick. il diag Concrete Cem 6:78-80 F '15
See also Bridges

See also Bridges

## Cost

Cost of concrete culverts and bridges in Milwaukee county, Wisconsin, in 1913. il Eng & Contr 42:486-7 N 18 '14

## Cumberland, Maryland

Water supply

Construction of Cumberland waterworks. F. H. Eastman. il Eng Rec 71:137-8 Ja 30 '15 Water-supply and typhoid fever at Cumber-land, Md. A. G. Fowler and M. J. Colton, il Eng N 73:969-70 My 20 '15

Cumberland road

Old National road and its reconstruction. C. H.
Moorefield, il diags Eng & Contr 43:227-9
Mr 10 '15

Cummins amendment, See Railroad law Cumulative voting. See Corporations

Cuneiform inscriptions. See Inscriptions, Cuneiform

Cuneiform writing

Cuneiforms. W. Rice. Inland Ptr 54:367-8 D '14

Cupellation

Well governing cupellation losses. W. J. Shar-wood. Am Inst Min E Bul 104:1671-5 Ag '15; Excerpts. Met & Chem Eng 13:927 D 1 '15; Discussion, Am Inst Min E Bul 108:2454 D '15

Cupola furnaces

Bridging of a cupola, W. J. Keep. Foundry 43:310 Ag '15
Continuous malleable cupola practice increasing output of malleable castings. L. E. Gilmore. Iron Age 95:306-8 F 4 '15
Cupola bed and blast pressures. R; Moldenke. Foundry 43:98 Mr '15
Cupola melting experiments. Iron Age 96:187
Jl 22 '15; Same. Ind Eng 15:105 S '15
Cupola operation for continuous pouring. J. F. Ervin. il Iron Age 96:183-5 Jl 22 '15
Desulphurization in cupola practice. Iron Age 96:488-9 Ag 26 '15
Foundry cupola of new and interesting design. G. R. Brandon, diags Foundry 42:499+ D '14
How to increase safety of cupola operations. il diag Foundry 43:445-6 N '15
Insufficient air for the cupola. W. J. Keep and G: C. Hicks. Foundry 43:102-3 Mr '15
Large heats made in small cupolas. J. H. Anderson, il Foundry 43:241-2 Je '15
Idquid fuel for melting. Iron Tr R 57:222-3
Jl 29 '15
New system of tuyeres. diag Foundry 43:381

New sy system of tuyeres. diag Foundry 43:381

New system of tuyeres, diag Foundry 45:381 S '15
Points on cupola practice, R. C. Hogden, Foundry 43:17-18 Ja '15
Preventing cupola explosions, F. Osswald, il diag Iron Tr R 55:1228+ D 31 '14
Regulating the height of fuel bed in cupolas, R: Moldenke, Foundry 43:28 Ja '15
Scientific operation of a cupola, D: Townsend, il diag Iron Tr R 57:133-5 Jl 15 '15; Same, Foundry 43:322-4 Ag '15; Same, Iron Age 95: 590-1 Mr 11 '15
Slow cupola melting, Foundry 43:167 Ap '15
Slow melting and cupola lining burning-out, W. J. Keep, Foundry 43:183-4 My '15
Slow melting in the cupola, C. Metcalf, Foundry 43:196 Mr '15
Slow melting in the cupola, J. H. Anderson, Foundry 43:180-1 My '15
Straight or boshed cupola lining, W. J. Keep,

Straight or boshed cupola lining. W. J. Keep. Foundry 43:183 My '15

Use of relief valves on cupola blast pipes. Foundry 43:26-7 Ja '15

See also Foundry practice

Curbs

Akron, Ohio, curbs and gutters. J. A. Gehres, Munic J 38:219 F 18 '15 Buckeye Berea curbing. il Munic Eng 48:371-3 Je '15

Construction details and costs. Munic J 38:153-

Curb and gutter in cities and counties, 1915; tabulation, Munic Eng 48:262-4 Ap '15
Increased radius of curb at street corners, il diag Eng & Contr 44:168 S 1 '15; Eng Rec 72:229 S 1 '15; Good Roads n s 10:161 S 4 '15; Munic J 39:433-4 S 16 '15; Munic Eng 49:183-4 N '15

Street and sidewalk improvement in the United States and Canada; tabulation. Munic Eng 48:352-8 Je '15
Street curbs of sandstone in Toledo. C: L. Sawyer. Munic J 38:40 Ja 14 '15

Curbs, Concrete

Analysis of concrete curb construction for suburban improvements near New York city.

A. C. Haskell, il diags Eng & Contr 43:58-61
Ja 20 '15

Concrete curb and gutter as constructed in Denver. E. B. Van de Greyn, il Munic Eng 48:16-18 Ja '15

do:10-16 Ja 16 Constructing concrete curbs. H. W. Hatton, diags Munic J 38:768-70 Je 3 '15 Costs reduced by monolithic curb, gutter and pavement. il diags Eng Rec 71:111 Ja 23 '15

Curtains. See Lace curtains

Curtis, Truman

Truman Curtis, cartoonist. H. Harley. il Inland Ptr 56:84-6 O '15

Curtis publishing company
Equipment of large publishing house; power plant, interior wiring and special features of the Curtis publishing company's building, Independence square, Philadelphia. il diags plans Elec W 65:905-11 Ap 10 '15
Saving with electric vehicles. il Elec W 65: 1063-6 Ap 24 '15

Curve plotting

urve plotting
Estimating curves for standard bridges of the
Illinois highway department, G. F. Burch,
il diags Eng & Contr 43:123-6 F 10 '15; Same
cond. Eng Rec 72:171-2 Ag 7 '15
Graphic method for speed-time and distancetime curves. E. C. Woodruff, Am Inst E E
Pro 33:1689-92 N '14; Discussion. 34:2804-46

tim. Pro 3

Graphic methods for presenting data. W. C. Brinton, diags Eng M 48:396-406, 551-68 D '14-Ja '15

Method of laying out curves. Colliery 36:144 O

Plotting the involute curve. J: Edgar. diags Mach 21:480-2 F '15
Railway motor characteristic curves, E, E. Kimball. il Gen Elec R 18:296-9 Ap '15
Two ways of laying out a compound curve. S. Striezheff. Elec Ry J 45:426 F 27 '15

Curves

Urves Curves for solving the hydrostatic catenary. H. M. Gibb. Eng N 73:668-70 Ap 8 '15 Curves for strength and deflection of very long columns. E. L. Robinson. Eng N 73: 1108-9 Je 10 '15 Elastic curve applied to the design of the Sciotoville bridge. D. B. Steinman. Eng Rec 72:258-60 Ag 28 '15 Hydrostatic catenary, flume on a concrete

Sciolovine Bridge. D. D. Sciolina. 22:258-60 Ag 28 '15
Hydrostatic catenary flume on a concrete aqueduct. H. B. Muckleston. il diags map Eng N 74:58-63 Jl 8 '15
To find maximum overhang of car on curve at

platform. L. C. Jordan. Eng Rec 71:340 Mr Vertical

ertical curve for conveyers and inclined planes. R. J. Sampsom. Colliery 35:663-4 J1

See also Curve plotting; Railroads-Curves and turnouts

Cut-outs. See Electric protective apparatus Cutlery

Cutlery works of Thiers. J. Boyer, il Sci Am S 79:184-5 Mr 20 '15 Future of Sheffield light trades. Engineer 119: 558-9 Je 4 '15

What capturing a German trade means. Sci Am 112:406 My 1 '15 Cutting machines

Air-operated cutting-off machine. il Iron Age 96:1165 N 18 '15 Anderson die forming machine. il Mach 22: 157-8 O '15

urtis automatic shrapnel-shell cutting-off machine. il Mach 21:925-6 Jl '15 Curtis

Cutting-off attachment for lathes. il diags Engineer 120:339 O 8 '15

Cutting tools. il Engineer 119:275-7 Mr 19 '15 Cutting tools for bars and wheels, il Iron Tr R 57:677-8 O 7 '15

Flue cutter. L: Lebovitz. diags Ry Age (Meched) 89:542 O '15

Gang slitting machine for metal sheets, il Iron Age 96:417 Ag 19 '15

Gould & Eberhardt turret-type ring gear roughing machine, il Mach 21:761-2 My '15

Cutting machines - Continued

Heavy cutting-off machine, by the George Gorton machine co., Racine, Wis, il Iron Age 95:1054-5 My 13 '15 Machine for cutting bevel gears, il Iron Tr R

56:465+ Mr 4 '15 Machine for cutting off copper bands, il diag Iron Age 96:243 Jl 29 '15; Mach 21:1020 Ag

'15
Machine for cutting rail ends. il Iron Age 96: 1183 N 18 '15
Miter cutting machine for steel shapes, il Iron Age 95:1119 My 20 '15
New cutting off machine, by the Williams tool co. il Iron Tr 8 56:932 My 6 '15
Rotary cutting-off machine. il diags Engineer 119:83-5 Ja 22 '15
6-in. rotary cutting off machine. il Iron Age 96:126-7 Jl 15 '15
Special bar cutting-off machine, il Iron Age

96:126-7 Jl 15 '15 Special bar cutting-off machine, il Iron Age 96:363 Ag 12 '15 Special shrapnel cutting-off machine, il Iron Age 96:193 Jl 22 '15 Trimming machine for shrapnel shells, il Iron Age 95:1225 Je 3 '15

See also Drilling and boring machinery; Gear cutting; Grinding wheels; Machine tools; Metal cutting; Milling machines; Steel cutting; Thread cutting machines

Cutting machines (for textiles)
Cameron principle of cutting fabrics, il Textile World 49:605-6 S 15

Cuyuna range. See Iron mines and mining-Minnesota

Cyanamid

yanamid
Cyanamid process. F. S. Washburn, Met & Chem Eng 13:309-14 My '15
Cyanamid works at Niagara Falls. il plan Eng N 73:16-21 Ja 7 '15
Fixation of atmospheric nitrogen. W. S. Landis. il Met & Chem Eng 13:214-18 Ap '15; Same. J Ind & Eng Chem 7:435-8 My '15
Recent advances in the chemistry of the cyanogen compounds. J. E. Clennell. bibliog Am Inst Min E Bul 106:2115-28 O '15; Same pt 2. Met & Chem Eng 13:756-8 O 15 '15

Cyanic acid
Use of cyanic acid in glacial acetic acid solution, and in mixtures of glacial acetic acid with other organic solvents; derivatives of 1-isobutyric acid amino-5-dimethylhydantoin. J. R. Bailey and W. T. Read. Am Chem Soc J 37:1884-93 Ag '15

Cyanide plants

yanide plants
Amador consolidated milling plant, Amador
City, Calif. T. S. O'Brien, il flow sheet Eng
& Min J 100:255-7 Ag 14 '15
Building the Tough-Oakes mill. J: A. Baker,
il diags Eng & Min J 100:869-74, 915-18 N
27-D 4 '15

11 diags Eng & Min J 100:869-74, 915-18 N 27-D 4 '15
Consulting metallurgist and metallurgical investigations. W. B. Blyth. Met & Chem Eng 13:251-2 Ap '15
Effect of mineralized waters in cyanide mills; abstract. T.: B. Stevens and W. S. Bradley. Met & Chem Eng 13:389 Je '15
Labor and power used in cyanide mills. H. A. Megraw. Eng & Min J 99:312-14 F 13 '15
Mill and cyanide plant of Chiksan mines, Korea. C: W. De Witt, il plan Am Inst Min E Bul 101:931-6 My '15; Abstract. Met & Chem Eng 13:388 Je '15
Piegan-Gloster cyanide mill. A. McLaren. il Eng & Min J 100:177 Jl 31 '15
Pittsburg-Dolores mining co.'s mill at Rockland, Nevada. E. J. Schrader. il Eng & Min J 99:653-4 Ap 10 '15
Rainbow mill, Oregon. W. M. Dake, jr. il plan Eng & Min J 99:1103-6 Je 26 '15
Simple cyanide-plant design. S. A. Worcester. diags flow sheet Eng & Min J 100:631-3 O 16 '15
Tonopah plant of the Belmont milling co. A. H.

Tonopah plant of the Belmont milling co. A. H. Jones. il diags flow sheet Am Inst Min E Bul 104:1731-58 Ag '15; Abstract. Met & Chem Eng 13:811-12 N 1 '15

Cyanide process

Aluminum precipitation at Nipissing. E. M. Hamilton. Eng & Min J 99:568-71 Mr 27 '15 Analysis of cyanide practice. H. A. Megraw. Eng & Min J 99:98-9 Ja 9 '15 Assay of cyanide solutions, lead acetate method. diags Eng & Min J 100:521-2 S 25 '15

Assaying gold-bearing cyanide solutions. D. M. Levy and H. Jones. Eng & Min J 100:150 Jl 24 '15

24 '15 Chart for determining tailings value. W. J. McCauley. Eng & Min J 99:575 Mr 27 '15 Combined cyanide and other processes. H. A. Megraw. Eng & Min J 98:1007-9, 1127-9 D 5, 26 '14

26 '14
Cost of cyaniding. H. A. Megraw. Eng & Min J 99:485-7 Mr 13 '15
Cyanidation of low-grade sulphide ores in Colorado. H. C. Parmelee. ii plan Met & Chem Eng 13:421-5, 477-9 Jl-Ag '15
Cyaniding at the Bulfinch proprietary, western Australia, diag Met & Chem Eng 13:331-2 My '15
Cyaniding at the Sons of Gwalia Australia. A

Cyaniding at the Sons of Gwalia, Australia. A. Wauchope. flow sheets Met & Chem Eng 13; 925 D 1 '15

Gyaniding practice of Churchill milling co., Wonder, Nev. E. E. Carpenter, plan Am Inst Min E Bul 102:1317-32 Je '15; Abstract, flow sheet Met & Chem Eng 13:813-14 N 1

Development of continuous counter-current decantation in cyanidation of slime. W. J. Pentland. plan Met & Chem Eng 13:105-7 F

'15
Effect of air in zinc-dust precipitation systems. D. W. Minier. il diag Eng & Min J 99:534-5 Mr 20 '15
Effect of carbon in contact with auriferous cyanide solutions; abstract. W. R. Feldtmann. Met & Chem Eng 13:339 Je '15
Effect of carbon or graphite on auriferous cyanide solutions. P. T. Brühl. Met & Chem Eng 13:873-4 N 15 '15
Electrolytic precipitation of gold, silver and copper from cyanide solutions. G. H. Cleven-

nectrolytic precipitation of gold, silver and copper from cyanide solutions. G. H. Clevenger, diags Met & Chem Eng 13:803-6, 852-60 N 1-15 '15

ger. diags Met & Chem Eng 13:803-6, 852-60 N 1-15 '15
Filtration of slime. L. D. Mills. Met & Chem Eng 13:724 O 15 '15
Gold milling in California—a comparison. L. A. Palmer. il diag Met & Chem Eng 13: 617-24 S 15 '15
Gold precipitation on paper. D. Lay. Eng & Min J 100:276-7 Ag 14 '15
Grinding ore for cyanidation; a suggested modification for all-slime practice. W. J. Pentland. Met & Chem Eng 13:205-6 Ap '15
Grinding ore for cyanidation; a suggested modification for all-sliming practice. E. S. Pettis. Met & Chem Eng 13:9-10 Ja '15
Liquid jets. C. T. Du Rell. Met & Chem Eng 13:714-16 O 15 '15
Method for the determination of gold and silver in cyanide solutions. L. W. Bahney. if Am Inst Min E Bul 98:339-44 F '15; Discussion. 101:1137-9 My '15
Notes on Homestake metallurgy; stamp milling; analysis of lost time; cost. A. J. Clark. il Am Inst Min E Bul 103:1381-1400 Jl '15; Abstract. Met & Chem Eng 13:764-6 O 15 '15; Discussion. Am Inst Min E Bul 108:2453-4 D '15

Precipitating apparatus for use in cyaniding, plan Eng & Min J 99:1079 Je 19 '15
Precipitation of cyanide solutions. G. H. Clevenger. Met & Chem Eng 13:725 O 15 '15
Process of cyaniding: a patented procedure. Met & Chem Eng 13:871 N 15 '15
Pulp constants, with tables to facilitate tonnage calculations for pulps of all usual solution and dry slimes specific gravities. G. H. Clevenger. H. W. Young and T. N. Turner. Eng & Min J 98:1079-94 D 19 '14
Recent advances in the chemistry of the cyanogen compounds. J. E. Clennell. bibliog Am Inst Min E Bul 106:215-28 O '15
Refining cyanide precipitates. H. T. Durant. Eng & Min J 100:523-4 S 25 '15
Slime agitation and solution replacement

ime agitation and solution replacement methods at the West End mill, Tonopah, Nev. J. A. Carpenter, diag Am Inst Min E Bul 104:1639-51 Ag '15; Same, Met & Chem Eng 13:671-6 O 1 '15 Slime

Solution of gold and silver. M. H. Kuryla. Met & Chem Eng 13:723-4 O 15 '15

System of zinc-shaving disposal, J. Simmons. il Eng & Min J 100:725 O 30 '15

Treatment of arsenical-antimonial sulphide ore; abstract. K. B. Moore and H. R. Edmands. Met & Chem Eng 13:508-9 Ag '15

Cyanide process -- Continued

yanide process—Continued
Tube-milling in all-slime cyanide practice.
W. J. Pentland. Met & Chem Eng 12:750-3;
13:204-5 D '14, Ap '15
Tube-milling tonnage calculation and notes on tube-milling. J. H. Haynes. Met & Chem Eng 13:10-12 Ja '15
Use of hydrometallurgical apparatus in chemical engineering. J: V. N. Dorr. il diags J Ind & Eng Chem 7:119-30 F '15; Same. Met & Chem Eng 13:55-9, 91-8 Ja-F '15
Zinc-dust precipitation tests. N. Herz. Am Inst Min E Bul 104:1507-13 Ag '15; Abstract. Met & Chem Eng 13:973-4 D 15 '15
Zinc in the cyanide mill. A. Dorfmann. Eng & Min J 10:150 O 13 15
See also Cyanide plants

See also Cyanide plants

Cyanides

Cyanide consumption in the United States and Cyanide consumption in the United States and Canada. Met & Chem Eng 12:743-4 D '14 Cyanide from coal gas. C. C. Tutwiler. Met & Chem Eng 12:785 D '14 Making cyanide from cyanamide. Eng & Min J 99:272 F 6 '15 Metal cyanides. Metal Ind n s 13:474-5 N '15

Determination of Prussian blue in washer sludge and spent oxide. Am Gas Light J 103: 151 S 6 '15

Cyanogen compounds

Recent advances in the chemistry of the cyanogen compounds. J. E. Clennell. bibliog Am Inst Min E Bul 106:2115-28 O'15; Same pt 2. Met & Chem Eng 13:756-8 O'15'15

Cyclecar the future means of transportation. H. K. Randall. Automobile 31:1076 D 10 '14 Morse cycle car has front drive. il Automobile 33:277 Ag 12 '15

Cyclograph. See Cathode ray tube

Cylinders

Binder for cylinder cores. W. J. Keep. Foun-dry 43:240 Je '15 Cylinder friction and lubrication testing apparatus. A. Flowers. diag Power 42:208-10

Machining motor cycle parts. D. T. Hamilton. il Mach 21:377-80 Ja '15
Practice of the oxy-acetylene welding process; welding of cylinders. S. W. Miller. il Mach 22:111-14 O '15

22:111-14 O '15
Quick-closing door for pressure cylinders. il
diag Eng N 73:1064-5 Je 3 '15
Thickness of cylinder wall. T: N. Haffner.
Mach 21:373 Ja '15
Weight of rods or cylinders per running inch.
W. L. Tryon. Foundry 43:16a, 58a Ja-F '15

See also Pistons

Cypress and juniper trees on the Rocky mountain region. G: B. Sudworth. 26 pls 11 maps U S Agric Bul 207:1-36 '15
Southern cypress. W. R. Mattoon. il map U S Agric Bul 272:1-74 '15
Suggestions for using cypress knees. H. F. Weiss. il Am For 21:1041-2 N '15
Use of native woods for interior finish. C. M. Price. il Brickb 24:219-21 S '15

Dairy houses Plan for a small dairy house. E. Kelly. il plan U S Agric Farmers' Bul 689:1-4 '15

Dairy products British India. U S Sp Cons Rep 72:370-5 '15

il, gas, and water content of Dakota sand in Canada and United States, L. G. Huntley, Am Inst Min E Bul 102:1333-53 Je '15; Discussion. 108:2428-30 D '15

Dallas-Celilo canal Lock gates for Dallas-Celilo canal, diag plan Eng Rec 70:614-16 D 5 '14

Dam failures

Blowout at end of concrete dam, Seneca Falls,
N. Y. il Eng N 74:570-1 S 16 '15

Construction, failure and reconstruction of a small dam near Tullahoma, Tenn. J: Wilkes. Eng & Contr 42:454-7 N 11 '14 Failure of Lyman dam, Arizona. Eng N 73: 794 Ap 22 '15 Failure of small earth dam. G: H. Ruhling. il Eng N 73:1121 Je 10 '15 Failures and partial failures of dams in Pennsylvania. Eng & Contr 43:75 Ja 27 '15

Damages

Adjustment of the consequential damages at the Tower Grove crossings. L. R. Bowen.
Assn Eng Soc J 55:116-21 O '15
Protecting dealer on producer's guarantee.
E. J. Buckley. Metal Work 84:593 N 5 '15

See also Employers' liability; Personal injuries; Railroads—Claims; Street railroads-Claims

Damascus steel

Damascus blades. Sci Am S 79:200-2 Mr 27 '15

Damask steel. See Damascus steel

Damp-proof timber floor, Cost of. J. A. Holmes. Fing N 72:102-5 Ag 27 114, Same, Ind 1 14:372-3 S '14; Same, Bldg Age 37:48 '15

Dampers

Dampers for large sheet metal ducts. diags Metal Work 83:668 My 7 '15

America's greatest irrigation project; Bassano dam, southern Alberta. Z. E. Black. il Sci Am 113:252-3 S 18 '15

dam, southern Alberta. Z. E. Black. il Sci Am 113:252-3 S 18'15
Bombay hydro-electric scheme. A. Dickinson. diag map Inst E E J 53:693-5 My 15'15
Caverns under the Austin, Texas, dam. A. C. Blanton. map Eng N 73:788-9 Ap 22'15
Considerations of sliding, overturning, crushing and blow-outs in dam design, by the Ohio river board. W. A. Mitchell. diags Eng & Contr 44:193-4 S 8'15
Contract methods and equipment for a typical Ohio river dam. K. H. Shriver. il diags plan Eng N 73:806-11 Ap 29'15
Coon Rapids low head hydro-electric development on the Mississippi river near Minneapolis, J. W. Link. il diags plan W Soc E J 19:979-1006 D'14; Same cond. Eng & Contr 43:151-2 F 17'15; Discussion. W Soc E J 19:1007-15 D'14
Design low dam for 30-foot height increase across Nolachuckey river. W. V. N. Powelson. il Eng Rec 71:175-6 F 6'15
Handling hydraulic fill on Piute dam. J. Jenson, il diag Eng Rec 72:80-1 Jl 17'15
Hidia dam on Euphrates river, il diags plan map Eng Rec 71:24-5 Ja 2'15
How Colorado dam construction is supervised. Eng Rec 72:252-3 Ag 28'15
Hydraulic fill dam for an earthquake region: work on the Calaveras reservoir of the San Francisco water supply. Sci Am 112:154+F 13'15
Hydro-electric plant at a Bolivian tin mine.

Work on the Calaveras reservoir of the San F 1a' 15
Hydro-electric plant at a Bolivian tin mine. M. R. Lamb. il Eng & Min J 99:7-9 Ja 2' 15
Jam-proof dam. plan Eng N 73:895 My 6' 15
Lahontan dam, Truckee-Carson irrigation project, Nevada. D. W. Cole. il diags map Eng N 73:758-62 Ap 22' 15
Methods and costs of belt conveyor earthhandling for the Lahontan dam. Eng & Contr 44:414 N 24' 15
Models, properly designed, show correctly performance of dams and turbines. B. F. Groat. Eng Rec 72:377-8 S 25' 15
Pennsylvania commission issues rules regarding dams. Eng Rec 72:225 Ag 21' 15
Percolation and upward pressure of water: abstract. W. A. Mitchell. Am Soc M E J 37: 121-2 F' 15
Provision for upward pressure and interior drainage in designing new Lock Raven dam at Balcimore. Eng & Contr 42:100 F' 15' 15
Sheerboards versus summit pools in hydraulic dam construction. R. M. Overstreet. Eng Rec 70:678 D 19' 14
Spaulding-Drum power development: with discussion. J: A. Britton. il diags Am Soc M E J 37:215-22 Ap' 15
Swedish government builds hydroelectric plant above the Arctic circle. il diags Eng Rec 72:156-9 Ag 7' 15
Uses for power from irrigation dams; abstract. E. K. Scott. Ind Eng 14:412-13 O'14

Dams - Continued

Water slopes of earth dams protected in novel way. A. P. Davis and D. C. Henny. Eng Rec 72:452 O 9 '15

West Fork waterworks dam at Fort Worth, il diags Eng Rec 71:147-8 Ja 30 '15 West Fork waterworks dam at Fort Worth, H. G. McCormick, J. B. Hawley, Eng Rec 71:307-8 Mr 6 '15 Winter operation of Stoney gates, il diag Eng Rec 70:691 D 26 '14

See also Cofferdams; Dam failures; Embankments; Hydroelectric plants; Irrigation; Reservoirs; also Elephant Butte dam; Ken-

#### Architecture

Architecture of Kensico dam. A. D. Flinn, il diag Eng N 74:433-6 S 2 '15

## Foundations

Excavation for foundation of Elephant Butte dam. E. H. Baldwin. il diags plan Eng N 73:49-54 Ja 14 '15
German studies of uplift pressure on masonry dams. R. Schaefer. diags Eng & Contr 44: 218-21 S 22 '15

Grouting foundations for gravity-section dam. H. S. Johnston. diags Eng Rec 70:650-1 D 12

Micaceous rock requires careful watching. C. M. Saville. Eng Rec 72:519 O 23 '15 Rock-fill dam with some extraordinary foun-dation problems. M. C. Hinderlider, il diags Eng N 73:660-4 Ap 8 '15

Dams. Concrete

All-concrete dams: the next step in the evolution of masonry dam construction. Eng & Contr 43:89 F 3 '15
Arrowrock dam. C: H. Paul. il Boston Soc C E J 2:337-49 N '15

J 2:55:7-49 N '1b Austin dam and power plant. F. S. Taylor, il Eng & Contr 43:465-7, 492-5 My 26-Je 2 '15; Same cond. Elec R & W Elec'n 66:939-45 My 22 '15; Same cond. Eng N 73:1089-93 Je 3 '15

My 22 15; Same cond. Eng N 13:1033-35 Je Building the Mathis dams. E. Lauchli. il diags plans Eng N 74:529-32, 589-91 S 16-23 '15
Concreting methods and records, Elephant Butte dam. E. H. Baldwin. diags Eng N 74: 696-8 O 7 '15
Concreting the Spaulding dam, California. il Eng N 73:1057 Je 3 '15
Construction on Elephant Butte dam for reclamation service in New Mexico nears completion; views. Eng Rec 72:91 Jl 17 '15
Construction plant and methods for concrete work on the Lock twelve dam, Coosa river, Alabama. E. L. Sayers and A. C. Polk. diags plan Eng & Contr 43:260-5 Mr 24 '15
Construction plant at the Nepaug dam, Hartford, Conn. il Eng N 74:25-6 Jl 1 '15
Design and construction of the Lake Watrous dam of the New Haven water co. C. M. Blair, diags plan Eng & Contr 44:100-2 Ag 11 '15

loods top unfinished dam—green concrete uninjured. C. Wigmore, il Eng Rec 71:775 Je Floods

uninjured. C. Wigmore, il Eng Rec 71:775 Je 19 '15 Hollow reinforced-concrete structure replaces dam at Austin. Texas, which failed fifteen years ago. il Eng Rec 71:672-3, 707-9, 750-1 My 29-Je 12 '15 Hydroelectric development at Austin, Tex. il diags Elec W 65:1460-2 Je 5 '15 Kensico dam construction in 1914. W. F. Smith. il plan Eng N '73:966-8 My 20 '15 Masonry placing records at three dams compared. Eng Rec 71:213 F 13 '15 Multiple-arch dam to retain quartz mill tailings. il Eng N '73:818-19 Ap 29 '15 Multiple-arch diversion dam at Three Miles Falls, Oregon. H. D. Newell. il diag Eng N '73:1009-12 My 2,' '15 Old and new Bear valley dams and Crags dam in service. J. B. Lippincott. il Eng N '74: \$54-5 O '25 '15 \$101,000 hollow concrete dam, St. Francis river, diags Eng N '74:1032-3 N 25 '15 Placing masonry for the Elephant Butte dam, New Mexico. E. H. Baldwin. il diags Eng N '74:65-9 S 30 '15 Questions about the Austin, Tex., dam. J. D. Justin; F. S. Taylor. Eng N '74:182-3 Jl 22 '15

Reconstruction of the Austin, Texas, dam. il Eng N 73:528-9 Mr 13 '15
Reinforced concrete storage dam at Swift Current, Sask., Canada. J. B. Babcock. il diags Concrete Cem 6:199-201 Ap '15
Ripogenus dam on the upper Penobscot in Maine. il Eng N 74:282-3 Ag 5 '15
Salmon creek dam; a constant-angle arch type. il map Eng N 73:472-4 Mr 11 '15; Abstract. Eng M 49:282 My '15
Small impounding and diversion dam and measuring weir at Jordan Narrows. S. Q. Cannon. il Eng N 73:860 My 6 '15
Thermophones in Kensico dam. W. F. Smith. diags Eng N 72:1172 D 10 '14
Well-designed concrete plant aids construction of waterworks dam. il plan Eng Rec 72: 602-4 N 13 '15

Yardage record at Kensico dam due, in part, to operation of mixers. G: T. Seabury. Eng Rec 71:199 F 13 '15 Dams, Mine. See Mine dams

Danger signs. See Signs

Daniels, Josephus, 1862-

Our naval development as related to national defense. J: R. Edwards. Eng M 50:173-94 N

Dardanelles

Defenses of Constantinople. H. C: Woods. il Sci Am S 80:2-3 Jl 3 '15 Forcing the Dardanelles. il map Sci Am 112: 244, 264-5, 316-17 Mr 13-20, Ap 3 '15 Lesson of the Queen Elizabeth. Sci Am 112:

Super-dreadnought Queen Elizabeth at the Dardanelles, plan Sci Am S 79:299 My 8 '15

Dark days

Dark days and forest fires, C. F. Talman, map Sci Am 177:729 Mr 6 115

Dark rooms. See Radiography

Dartmouth college, Hanover, New Hampshire Gymnasium: designs, Brickb 24:pl 54-5 Ap Davits

Broady, il diags Int Marine Eng 20:260-4, 305-9, 355-8 Je-Ag '15
Marten-Freeman compensating davit. diag Int Marine Eng 20:373-4 Ag '15

Day labor

& Contractor and management engineering. Eng & Contr 42:573 D 23 '14 Experience in paving by day labor at Duluth. Minn. J: Wilson. Eng & Contr 43:445 My 19

Sewer work by day labor at Carlisle, Pa.; methods employed, hours of labor and item-ized costs. J: C. Hiteshaw, il Munic J 38:506-8 Ap 15 '15

Air shaft illumination as studied by models. C. H. Sharp. Illum Eng Soc 9:598-610 no 7 Daylight

Planning for daylight and sunlight in buildings; with discussion. L. B. Marks and J. E. Woodwell. bibliog il diags Illum Eng Soc 9: 643-86 no 7 '14

Daylight, Artificial Artificial daylight. H. E. Ives. bibliog il J Fr Inst 177:471-99 My '14; Same. Sci Am S 78; 396-8, 412-14 D 19-26 '14 Artificial daylight in practice. M. Luckiesh. il Elec W 66:71-3 Jl 10 '15; Abstract. Eng M

49:918 S '15

Attificial daylight—its production and use. M. Luckiesh and F. E. Cady. bibliog Illum Eng Soc 9:839-64 no 8 '14; Same. Am Gas Light J 101:390-1 D 21 '14; Abstract and discussion. Elec W 64:655 O 3 '14; Discussion. Illum Eng Soc 9:864-72 no 8 '14; Discussion. Am Gas Light J 101:391+ D 21 '14

Data on artificial daylight units. C. H. Sharp. il Illum Eng Soc 10:219-21 no 3 '15

Daylight glass; abstract. S. H. Gage. Elec W 66:1041 N 6 '15

Development of daylight glass; with discussion. E: J. Brady. diags Illum Eng Soc 9: 937-60 no 9 '14

Gaseous-conductor lamp for color matching;

Gaseous-conductor lamp for color matching; abstracts, D. M. Moore, diags Elec W 66:1160 N 20 '15; Elec R & W Elec'n 67:949 N 20 '15; Met & Chem Eng 13:885 D 1 '15 Holding up the nurror, F. L. Godinez, Arch & Bldg 47:51-2 F '15

Dayton, Ohio

Electro-platers' 1915 convention city. W. Fraine. il Metal Ind n s 13:179-83 My '15 Topographic survey of the city of Dayton. R. H. Randall. Eng N 74:942-3 N 11 '15

#### Floods

Engineering lessons from the Ohio floods. J: W. Alvord. il Boston Soc C E J 1:85-108; Discussion. 1:109-17 Mr '14 Flood prevention plans for Dayton. W: S. Crandall. map Munic Eng 49:103-4 S '15

### Politics and government

Commission and city manager forms of government. H. H. Rumble, R. W. Peatross and J: E. Burke. Munic Eng 49:54-5 Ag '15 Commission-manager form of government and its relation to the engineering profession. H: M. Waite. Boston Soc C E J 2:1-14 Ja '15; Abstract. Eng M 48:894-6 Mr '15; Discussion. Boston Soc C E J 2:14-21 Ja '15 Dayton's progress under commission-manager. W: S. Crandall. Munic Eng 49:67 Ag '15

## Public works

Municipal exhibit at Dayton, il Munic J 39: 690-2 N 4 '15

## Daytona, Florida

## Sewerage

Sewage pumping, screening and sterilizing station at Daytona; specifications. plans Eng & Contr 42:525-7 D 2 '14

Dead animals

Removal of dead animals in cities. A. L. Bostwick. Munic J 38:64-5 Ja 21 '15

Electrical equipment for enabling the deaf to hear. il Elec W 66:1221-2 N 27 '15

Deafness

Deaf-mutism produced by shock, Sci Am S 80:336 N 20 '15

Debating

Section foreman's debating society on the C. M. & St. P. Ry. W. H. Kofmehl. Ry R 56: 665 My 15'15 the

Deht

Tow "receipt in full" protects the holder. E. J. Buckley, Metal Work 83:622 Ap 23 '15 How

Decantation

Development of continuous counter-current decantation in cyanidation of slime. W. J. Pentland. plan Met & Chem Eng 13:105-7 F

Use of hydrometallurgical apparatus in chemical engineering. J: V. N. Dorr. diag J Ind & Eng Chem 7:126-9 F '15; Same. Met & Chem Eng 13:94-6 F '15

## Decatur, Illinois

Water supply

Filtration plant, city of Decatur, Illinois. H. Ruthrauff. il Am Water Works Assn J 2: 455-64 Je '15

Deckhouses. See Naval architecture

Decoration and ornament

Craft of tile-making and its relation to architecture. J. H. D. Allen. il Am Inst Arch J 3:5-11 Ja '15

See also Architecture—Details; Concrete, Ornamental; Design, Decorative; Furniture; House decoration; Ironwork, Architectural; Lighting fixtures; Metal work; Mural painting and decoration; Show windows; Stucco; Teartile Assign Textile design

Decorative design, See Design, Decorative

Decremeters

Direct-reading instrument for measuring the logarithmic decrement and wave length of electromagnetic waves. F: A. Kolster, il diags U S Bur Stand Bul 11:421-55 My 10 '15 Recent advances in wireless measuring instruments, H. T. Wade, il diags Sci Am 113:356

Deerfield river, Massachusetts

New plant marks further step in development
of Deerfield river, it diags map Eng Rec
72:371-7, 423-4 S 25-O 2 215

Defalcations. See Embezzlement

Defective children

Teaching defective children. A. M. Jungmann. Sci Am 112:361 Ap 17 '15

Deformations (mechanics)
Recent experiments on elastic hysteresis: abstract, R. Grammel, Am Soc M E J 37:115-

Dehydration

Centrifugal dehydration of water gas tar at Amsterdam. Am Gas Light J 102:349 My 31

Dehydrating oil plant of Nevada petroleum co., California. S. J. Hardison. il diags Am Inst Min E Bul 99:637-44 Mr '15 Dehydrating petroleum oil, diags Met & Chem Eng 13:570 S 1 '15 Use of iodine as a dehydrating and condensing agent. H. Hibbert. Am Chem Soc J 37:1748-63 Jl '15

Delaware and Hudson railroad 85th annual report. Ry Age 58:875-6, 915-18 Ap 23 '15

Delaware, Lackawanna & Western railroad Completing the summit cut-off of the Lack-awanna. il Ry Age 59:809-10 O 29 '15 Construction of the Hallstead cut-off, D. L. & W. R. R. il diags Ry R 56:111-15, 143-9 Ja

W. R. F 23-30 '15

Tunkhannock viaduct nearing completion, il Eng Rec 72:42-3 Jl 10 '15 Wireless telegraph and telephone on the D. L. & W. R. R. L. B. Foley, il Ry R 56:491-3 Ap 10 '15

Delhi, India British India. map U S Sp Cons Rep 72:176-81

Dementia. See Insanity

Demolition work. See Wrecking

Demonstration farms

Development of Long Island. H. B. Fullerton.

Ry Age 57:1040-1 D 4 '14

Demurrage

Impartial study of freight-car demurrage. G. C. White. Ry Age 58:828 Ap 16 '15 Using a blank to prevent demurrage. H. A. Russell. Iron Age 96:415 Ag 19 '15

Denatured electric current. See Electric currents

Dental cements

Germicidal efficiency of dental cements. P. Poetschke, il J Ind & Eng Chem 7:195-202 Mr '15

202 Mr 15 Germicidal efficiency of dental cements. P. Poetschke. J Ind & Eng Chem 7:1000-1 N '15 Possible sterilizing properties of dental ce-ments. W. V-B. Ames. J Ind & Eng Chem 7:723 Ag '15

Dental colleges

Evans museum and dental institute, University of Pennsylvania, Philadelphia: designs and plans. Brickb 24:pl 46-9 Ap '15 Two dental buildings: Evans museum and dental institute, University of Pennsylvania, Philadelphia. H. D. Eberlein. il plans Arch Rec 37:517-32 Je '15

Dental infirmaries. See Forsyth dental infirmary

Dental instruments and apparatus Small-sized dental motor for direct drive, il Elec W 65:563 F 27 '15; Elec R & W Elec'n 66:651 Ap 3 '15 Use of electricity in a dental infirmary, il Elec W 66:202-4 Jl 24 '15

Denver, Colorado

City planning and civic-center work in Den-ver. H: Read. il Am Inst Arch J 3:497-500 N

## Description

Sheet metal contractors in Denver, il Metal Work 83:794-5+ Je 4 '15

## Parks

Connecting roads to mountain parks of Denver, Colorado. O: B. Thum, il Munic Eng 49:15-17 Jl '15

Road construction in Denver's mountain parks. O. B. Thum. il plan Munic J 38:417-20 Ap

## Denver, Colorado Continued

## Streets

Concrete curb and gutter. E. B. Van de Greyn. il Munic Eng 48:16-18 Ja '15

### Water supply

Rotary screens remove macro-organisms from Denver's lake water supply, il Eng Rec 72;

Denver & Rio Grande railroad Abstract of annual report, map Ry Age 59: 845-6 N 5 '15

#### Deodorizers

Air ozonation, M. W. Franklin, J Ind & Eng Chem 6:852-3 O '14; Same, Am Soc Heat & V E 20:344-50 '14

V E 20:344-50 '11

Experiment with ozone as an adjunct to artificial ventilation, A. M. Feldman, Heat & Ven 12:35-6 Mr '15

Investigations on the nature and elimination of odors and dust from a garbage reduction plant, H. W. Mahr and A. C. Kraft, il diags J Ind & Eng Chem 7:778-85 S '15

Ozone—an aid to factory ventilation, V. D. Greene, diag Eng M 49:517-25 Jl '15

Test plant operated to deodorize oil refinery wastes, F. R. Hesser, il diags Eng Rec 72: 541-2 O 30 '15

Department stores Altman stores, New York. il Arch & Bldg 46: 439-46 N 14

Ames store, Cleveland, Ohio. il plans Arch & Bldg 47:359-64 O '15 Department store accounts. H: C. Magee. J Account 19:268-91 Ap '15

Heating and ventilation of main floor and vestibules of the Lord & Taylor store. J. Graham, diags Dom Eng 72:282-3 S 4 '15

Merchandising of hosiery and underwear. C. C. Parlin. Textile World 49:sup265+ My

Rosenbaum co. department store, Pittsburgh. J. Hunt. il Arch & Bldg 47:269-72 Jl '15 See also Mail order business

### Depreciation

Accounting for depreciation. J. R. Cravath, Elec W 65:213-14 Ja 23 '15
Accounting for depreciation. R. Sealy, Elec W 65:460-1 F 20 '15

W 65:460-1 F 20 '15
Basing depreciation on par value. Elec Ry J 45:1143 Je 19 '15
Depreciation J Account 18:492-3 D '14
Depreciation accounts. W. H. Lawton. Elec W 65:1678-9 Je 26 '15
Depreciation and confiscation. A. C. Humphreys. Ry Age 59:311-12 Ag 20 '15
Depreciation and valuation for rate making. L: H. Haney. J Account 19:344-51 My '15
Depreciation as applied to oil properties. P. W. Henry. Am Inst Min E Bul 97:23-30 Ja '15; Discussion. 101:1148-51 My '15
Depreciation formula of the American society of civil engineers. J: Bauer. J Account 20: 104-11 Ag '15
Depreciation in appraisals. J Account 19:458-60 Je '15
Depreciation in public utilities. Elec W 66:

Depreciation in public utilities. Elec W 66:

Depreciation in public utilities. Elec W 66: 743 O 2 '15
Depreciation, interest and manufacturing cost. W. C. Wright. J Account 20:361-4 N '15
Depreciation of machine tools; abstract. Ind Eng 14:409 O '14
Depreciation of manufacturing plants. F: G. Colley. J Account 20:165-72 S '15
Depreciation of property. W. B. Curtiss. Gen Elec R 18:1099-1106 D '15
Depreciation problems. H. Erickson. Am Gas Inst Pro 9:pt 2, 1582-1638; Discussion. 9:pt 2, 1638-82 '14
Discussion of depreciation. P. J. Kealy. Eng & Contr 44:118-23 Ag 18 '15
Distributing overhead expense. N: T. Ficker. Eng M 50:254-8 N '15
Idaho court overrules depreciation deduction. Eng Rec 72:480-1 O 16 '15
In rate-fixing by commission, should depre-

In rate-fixing by commission, should depreciation be deducted from plant valuation? A. C. Humphreys. Am Gas Inst Pro 9pt 2, 1557-82; Discussion. 9:pt 2, 1638-82 '14

Life of way structure as affected by engineering and municipal conditions. P. N. Wilson, diags Elec Ry J 45:1212-13 Je 26 '15

Methods of figuring depreciation and present values. W: A. Del Mar. Ind Eng 14:402-3 O

Obsolescence as cause of depreciation. S. Walton. J Account 20:149-51 Ag '15
Problem of depreciation. G: O. May. J Account 19:1-13 Ja '15
Rational method of calculating depreciated value, H. P. Gillette. Eng & Contr 44:24-7 Jl 14 '15

Ji 14 15 Utilities bureau; conference on valuation, Phil-delphia, 1915. Elec Ry J 46:1031-2 N 20 '15 Valuation of water works properties. H. P. Gillette. Eng & Contr 43:486-8 Je 2 '15

## Derailments

erailments

Accident caused by defective wheels. H. W. Belnap. Ry Age 59:48 Jl 9 '15

How an axie tailed in service. il Iron Tr R 56:607-10+ Mr 25 '15

Mysterious derailments. R. P. Williams. Elec Ry J 45:1078-9 Je 5 '15

Report on freight train derailment, Chicago, Milwaukee & St. Paul Ry. Ry R 57:172-3 Ag 7 '15

 $7^{-745}$  Report on wreck due to broken car wheel, diags Ry R 56:789-91 Je 12 '15 Tender derailments. B. L. Wheatley. Ry R 56:684-5 My 15 '15 Tender derailments. G. W. Lillie. Ry Age (Mech ed) 89:58 F '15 Wreck due to a faulty car wheel, il Iron Tr R 57:937-49 + N 11 '15

### Derelicts

Hunting for derelict ships. il Sci Am 112:606

### Derrick cars. See Cars (derrick)

## Desert lands

United States mining statutes annotated. J. W. Thompson, U S Bur Mines Bul 94:pt 2, 946-51 '15

## Desert vegetation

Indiana desert. H. Maxwell. il Sci Am S 80: 248-50 O 16 '15

## Deserts

Motor travel in desert country of southern California, L: H, Eddy, il Eng & Min J 100: 835-7 N 20 '15

## Design

From the soil up—a new method of designing. A. Reuterdahl. Eng & Contr 42:581-5 D 23 '14

See also Architecture—Designs and plans; Architecture, Domestic—Designs and plans; Bridge design; Concrete construction—De-sign; Machinery—Design; Textile design sign;

## Design, Decorative

Edward Edwards and his art. S. H. Horgan. il Inland Ptr 55:516-17 Jl '15

Photo-kaleidograph. il Sci Am 112:103 Ja 30 '15 See also Textile design

## Des Moines, Iowa

## Politics and government

Commission and city manager forms of government. H. H. Rumble, R. W. Peatross and J: E. Burke. Munic Eng 49:52-3 Ag '15

Dessauer process
Röntgen motion pictures, il Sci Am 112:312
Ap 3 '15

Destroyers. See Torpedo boat destroyers

Detarring. See Gas purification

## Detonators

Gun-primers and detonators. Sci Am S 80:35 Jl 17 '15

New safety detonating fuse: Cordeau detonant. H. Souder. il diags Am Inst Min E Bul 94:2547-56 O '14; Abstract. Eng M 48: 416-18 D '14; Discussion. Am Inst Min E Bul 100:895-902 Ap '15

Primer on explosives for metal miners and quarrymen. C: E. Munroe and C. Hall, pls U S Bur Mines Bul 80:29-46 '15

Detroit, Michigan
City plan for Detroit. E. H. Bennett. plans
Am Inst Arch J 3:264-8 Je '15

Re-planning in Detroit: report to the Board of street railway commissions by Barclay, Parsons and Klapp. il Am Inst Arch J 3: 268-70 Je '15

Detroit, Michigan - Continued

Bridges

Closing Detroit-Superior arch, il Eng N 74:813-

Hotels

Hotel Statler, Detroit, Mich. il plans Arch & Bldg 47:89-101 Mr '15 Hotel Statler in Detroit. W. S. Wagner. il plans Arch Rec 37:320-39 Ap '15

Industries

Detroit's great growth due to its open shop policy. L. W. Moffett. Iron Tr R 57:143-7 Jl 15 '15

Lighting

Detroit's municipal lighting plant. T: Wilson. il plan Power 40:832-5 D 15 '14

Railroads

Economic value of terminal improvements at Detroit. Ry Age 59:739-40 O 22 '15 Station and office building of the Michigan Central railroad at Detroit. il Arch & Bldg 47:53-60 F '15

Rapid transit

Detroit purchase negotiations. Elec Ry J 45: 725 Ap 10 '15
Detroit's urban transportation needs—present and future—set forth. Eng Rec 71:427-8 Ap 3 '15

Report on Detroit traffic. Elec Ry J 45:664-5 Ap 3 '15

Streets

Methods and cost of removing an asphaltic macadam road surface, reworking the old material and relaying it as asphaltic con-crete. G. C. Dillman. il diag Eng & Contr 42:532-3 D 9 '14

Water supply

Municipal pumping stations of Detroit. T: Wilson. il Power 41:150-3 F 2 '15

Detroit, Toledo & Ironton railroad Abstract of annual report. Ry Age 59:847 N 5

Detroit United railway
Detroit municipal ownership proposal. Elec
Ry J 45:431 F 27 '15
Statement of income, profit and loss. Elec Ry
J 45:436-7 F 27 '15

Dextrin

Modification of starch by gaseous hydrochloric acid. F. C. Frary and A. C. Dennis. J Ind & Eng Chem 7:214-16 Mr '15

Diabetes Diabetic triad. Sci Am 113:244 S 18 '15

Dials. See Sundials

Diamond drilling. See Drilling and boring (earth and rocks)

Diaphragm method

Diaphragm method
Diaphragm method for the measurement of water in open channels of uniform cross-section. C. R. Weidner, bibliog il Wis U Bul Eng S 3:1-72 no 1 '14; Excerpts, Eng N 72: 532-4 S 10 '14; Eng & Contr 42:414-15 O 28 '14

Diastases

Quantitative extraction of diastases from plant tissues, R. W. Thatcher and G: P. Koch, Am Chem Soc J 36:2542-3 D'14

Didymium

Fractional crystallization of the picrates of the rare earths of the didymium group. L. M. Dennis and F. H. Rhodes. Am Chem Soc J 37:807-15 Ap '15

Die casting

Aluminum die casting a commercial achieve-ment. C: Pack, Metal Ind n s 13:412-13 O '15; Same, Foundry 43:456-7 N '15; Same, Iron Tr R 57:1036+ N 25 '15; Same cond. Iron

Aluminum die castings. A. B. Norton. Metal

Int n s 12:563-4 1) 11

Mines Q 36:48-50 N '14

Die casting: the metal, its use and the gas appliance used. C. E. Chapple, il Am Gas Light J 102:52-3 Ja 25 '15; Same Metal Ind n s 13:62-3 F '15

Die casting vs. machining. J. E. Schipper. il diags Automobile 33:451-4 S 9 '15
New die casting metal; Ampco bronze. Met & Chem Eng 13:931 D 1 '15
Plating of the troublesome die-castings. S. Herrick. Metal Ind n s 13:373-4 S '15
Precision castings. E. Buckingham. il diags Metal Ind n s 13:11-13 Ja '15
Successful nickel plating of die castings or articles made from sheet zinc. C: H. Proctor. Metal Ind n s 13:274 Jl '15 Die holders

Forms of die holders, diags Metal Ind n s 13:100-1 Mr '15

Die-sinking machines Jackson duplex die-sinking machine, il diag Mach 21:928-9 Jl '15

Dielectrics

Dielectrics
Dielectric

W 66:56 J1 10 15 Law of corona and spark-over in oil. F. W. Peek, jr. Gen Elec R 18:821-7 Ag '15 Volume resistivity and surface resistivity of insulating materials. H. L. Curtis. diag Gen Elec R 18:996-1001 O '15

Elec R 18:996-1001 O '15

Dies
Automatic indexing multiple drawing die.
J. M. Stabel. il diags Mach 21:915-16 Jl '15
Building precise dies on a rush order. il Iron
Age 95:1062-3 My 13 '15
Deep drawing in combination dies. il diags
Mach 21:663-4 Ap '15
Dies for drawing flanged shells. E. P. Davis.
diags Mach 21:1332-4 Mr '15
Don'ts for drop-forge die hardeners and users.
W. L. Goodrich. Mach 21:453 F '15 Establishing number of operations for drawing cylindrical shells. F. J. W. Sparkuhl.
Mach 21:729-32 My '15
Forging machine dies. J. Lee. diags Ry Age
(Mech ed) 89:37 Ja '15
Forging machine dies. J. W. McDonald. il
diags Ry Age (Mech ed) 88:639-40 D '14
Making a ribbed die. J: Leafstrom. diag
Mach 21:744 My '15
Mechanical production of drop forging dies.
E: K. Hammond. il Mach 22:1-5 S '15
Method for making and using piercing dies.
C: Doescher. diags Mach 21:581-2 Mr '15
New method of polishing diamond dies. diag
Mach 21:3740 O '15
Rectangular drawing and trimming. J. M.
Stabel. diags Mach 22:44-7 S '15
Repairing cracked dies. R. J. Albrecht. diags
Mach 22:9 S '15
Small aluminum tubes. J. P. Sheehy. il diags
Metal Ind ns 13:55-6 F '15

Small aluminum tubes. J. P. Sheehy. il diags Metal Ind n s 13:55-6 F '15 Three recently developed die heads. il Iron Age 95:134 Ja 14 '15

Tube forming die. A. H. Wilson, diags Mach 21:666-7 Ap '15 Universal link-cutting die. B. Geist, diags Mach 22:60-1 S '15

See also Metal work; Punching machinery; Sheet metal work

Diesel engines

Allis-Chalmers oil engine. il diag Munic J 38: 905 Je 24 '15

American Diesel engines; summary of different types. Iron Age 96:1170 N 18 '15

Breakdown of a Diesel engine at Oxford, Engineer 119:337 Ap 2 '15

Cracked and seized pistons on Diesel engines. G: E. Windeler. diags Power 42:210-11 Ag 10 '15; Abstract. Int Marine Eng 20:416 S '15 Diesel and semi-Diesel engines. Iron Age 96: 746-7 S 30 '15 Diesel engines-Continued

Diesel engine and its applications in southern California. W. H. Adams. diags Am Soc M E J 37:621-8 N 15; Excerpts. Iron Age 96: 1313-14 D 2 '15; Discussion. Am Soc M E J 37:699-703 D '15

Diesel-engine central station at Winchester, Ind.—cost of equipment. T: Wilson. il Power 41:562-4 Ap 27 '15 Diesel engine day at the Panama-Pacific international exposition. Iron Age 90:111 of 215

Dieset engine defended, R. W. Crowly, Power

Head of the contractor—why not?
H. D. Hammond. il Eng Rec 71:409-10 Mr
27 '15

27 '15 Diesel engine in America. M. Rotter. diags Power 42:524-7 O 12 '15 Diesel-engine installation at Palo Alto. H. Haas. il Power 41:502-4 Ap 13 '15 Diesel engine users' association. diag Engineer 120:36 Jl 23 '15

H. Haas. il Power 41:502-4 Ap 13 '15
Diesel engine users' association. diag Engineer
120:86 Jl 23 '15
Diesel engines for generator drive. C: Legrand. Am Inst E E Pro 34:1815-18 Ag '15
Diesel principle applied to small engines. il
diag Power 41:162-5 F 2 '15
Diesel-type engine in the United States. R. W.
Crowly. Elec W 65:412-14 F 13 '15
Diesel-type oil engine in European repute.
R. W. Crowly. Elec W 65:465-7 Mr 13 '15
Fairbanks-Morse internal-combustion engine.
il Eng & Min J 100:358 Ag 28 '15; Power 42:
550-1 O 19 '15
Heavy oil engine, its present status and future
development. A. H. Goldingham. il diags Am
Soc M E J 37:628-36 N '15; Excerpts. Iron
Age 96:1313-15 D 2 '15
How to select your prime mover. G. Fisk.
Iron Tr R 57:569-72+ S 23 '15
Large four-cylinder vertical Diesel engine of
the Busch-Sulzer brothers-Diesel engine
company, St. Louis. il Elec R & W Elec'n
66:41-2 Ja 2 '15; Elec W 64:1217 D 19 '14
McIntosh & Seymour 500-hp. Diesel engine.
F. R. Low. il diags Power 42:740-5 N 30 '15
Panama-Pacific exposition. F. R. Low. il diags
Power 42:261-6, 290-3, 341-2 Ag 24-S 7 '15
Panama-Pacific exposition. F. R. Low. il diags
Power 42:261-6, 290-3, 341-2 Ag 24-S 7 '15
Performance of Diesel engine pumping equipment of the Appleton, Wis., water works, il
plan Eng & Contr 44:244-6 S 29 '15
Reliability of Diesel engine operation at Hutchinson, Minn. T: Pitts. il Elec W 66:1029 N 6 '15
Southwark-Harris Diesel engine. il diags
Power 41:877-9 Je 29 '15
Southwark-Harris valveless engine. il Eng M
42:5upps-6 Ap '15
Swedish type Diesel engine. il Iron Tr R 57:
988 N 18 '15

Ap '15 e Diesel engine, il Iron Tr R 57:

Swedish type I

988 N 18 '15 Torsional oscillations of an engine shaft; abstract. O: Mies. diag Am Soc M E J 37:406-7

Two-stroke-cycle semi-Diesel engines, diag Elec W 65:679 Mr 13 '15 Vertical two-stroke-cycle Diesel engines, il Elec W 65:1203 My 8 '15

## Manufacture

Manufacture of the Diesel engine: production processes and the plant of the Busch-Sulzer bros., St. Louis. O. J. Abell. il diags plan Iron Age 95:57-64 Ja 7 '15

## Testing

Test of new type prime mover; Southwark-Harris crude oil engine, il Iron Tr R 57:274-5 Ag 5 '15
Tests on a Diesel engine; abstract. W. S. Burns. il Am Soc M E J 37:352-5 Je '15
Tests on Diesel engines when running light;

abstract. A. Balog. Am Soc M E J 37:404-6 Jl

Diesel engines, Marine
Craig Diesel type marine oil engine. il diags
Int Marine Eng 20:217-19 My '15
Defects and remedies of marine Diesel motors.
T. I. Grainger. Int Marine Eng 20:316-17 Jl
'15

Diesel engine applied to marine purposes. C. Kloos. il diags Power 42:734-8 N 23 '15

Diesel engine propelled ship, Pacific; abstract. W. Kaemmerer. Am Soc M E J 37:601-2 O W.

'15
Diesel motor tug Chickamauga. G: E. Nicholson. il Int Marine Eng 20:493-5 N '15
Doxford Diesel engine. Engineer 118:599-600; 119:4-6 D 25 '14-Ja 1 '15
First government-built Diesel engines. Power 42:738 N 23 '15
Large Diesel engined ships for marine navigation and their economic possibilities; abstract. W: Scholz. Am Soc M E J 37:228-30 Ap '15
Machinuty of modern submarines A. P. Chalk-

Machinery of modern submarines, A. P. Chalk-ley, il Sci Am 113:26+ Jl 3 15

Marine semi-Diesel engines. Sci Am S 80:287 O

15 Modern submarines in war and peace. S. Lake. il diags Int Marine Eng 20:450-6 O

Oil and suction producer gas engines for ship propulsion; abstract. Am Soc M E J 37:602

O '15
Operation of a marine Diesel engine. E. N.
Percy. Int Marine Eng 20:209-11 My '15
Performance of Diesel-engined motor ships. Int
Marine Eng 20:381 S '15
60 horsepower Niseco Diesel engine. il Int
Marine Eng 20:522-3 N '15
Submarine power plant. A. Hoar. il Sibley J
30:59-63 N '15

30:39-53 N '15
Thermodynamics of the marine engine; abstract. J; F. Wentworth. Int Marine Eng 20:17 Ja '15
Two- vs. four-stroke-cycle marine Diesel engine. G. C. Davison. Power 42:564-5 O 19 '15

Food for polar explorers. E. Shackleton. Sci Am S 79:36-7 Ja 16 '15 How much albumen is needed in our diet? M. Hindhede. Sci Am S 79:327 My 22 '15 Lime salts for soldiers. Sci Am 113:358 O 23 '15 Vitamines and cooking. D. McCaskey. Sci Am 113:379 O 30 '15

Vitamines, and their importance for the maintenance of health. Dr. Reinhardt. Sci Am 113: 238-9 S 11 '15

Sec also Nutrition

Digestion

Physiological activity of combined hydro-chloric acid. J. H. Long. Am Chem Soc J 37:1333-47 My '15

See also Enzymes; Mastication

Digestive ferments

Comparison of methods for the determination of the proteolytic activity of pancreas preparations. J. H. Long and A. W. Barton. Am Chem Soc J 36:2151-66 O '14

Dikes (engineering). See Embankments

Dimethylpyrone

Organic oxonium compounds: dimethylpyrone-hydrochloride. H. N. K. Rördam. Am Chem Soc J 37:557-67 Mr '15

Dimmers. See Electric lamps, Tungsten-Control

Dining car chairs Canadian Northern dining car chairs, diags Ry Age (Mech ed) 89:300 Je '15; Ry Age 59:272 Ag 13 '15

Dining cars
Steel passenger equipment for the Union Pacific. il diags Ry Age 58:1475-9 Je 25 '15 See also Buffet cars

Dinitrotyrosine

Studies on nitrated proteins; the syntheses of 3,5-dinitrotyrosine. T. B. Johnson and E: F. Kohmann. Am Chem Soc J 37:2164-70 S '15

Dinosaurs

Tyrannosaurus, a cretaceous carnivorous dino-saur. B. Brown. il Sci Am 113:322-3 O 9 '15

Dip needle surveying. See Magnetic surveying

Diphenylureachloride

Action of diphenylureachloride on organic bases. W: M. Dehn and E. M. Platt. Am Chem Soc J 37:2122-30 S '15

Dipotassium phosphate Conductivity study of the reaction between calcium nitrate and dipotassium phosphate in dilute solution. W. A. Withers and A. L. Feild. Am Chem Soc J 37:1091-1105 My '15

Dippers. See Buckets

Dipping fluids

Sheep dips in Uruguay. H. L. Spahr. Textile World 48:594 Mr '15

Dipping fluids, Arsenical

Blood-charcoal as a purifying agent for arsenic solutions previous to titration. R. M. Chapin. J Ind & Eng Chem 6:1002-3 D '14

Directories

Portland street corner directories. Munic J 39: 7 Jl 1 '15

Dirigibles. See Balloons and airships

See also Eastland (steamship)

Discount

Annuities and bond discount. R. J. Bennett. J Account 19:405-24; 20:1-20 Je-Jl '15 Cash discount. S. Walton. J Account 19:385-90 My '15

Discount on stock, S. Walton, J Account 20:

238-41 S '15
Tyranny of the engraver. A. S. Little, J Account 20:186-202 S '15

Discoveries in science. See Science

Diseases dangerous at different periods of life. Sci Am S 79:149-50 Mr 6 '15

See also Tuberculosis; Typhoid fever; also ubhead Diseases under various subjects, e.g. Nervous system—Diseases

Diseases, Industrial

Nystagmus (trembling of the eyes) of the miners. Colliery 35:505 Ap '15

Phthisis conditions on the Rand. A. C. Key. Eng & Min J 99:28-9 Ja 2 '15

Recognizing vocations from the teeth. il Sci Am S 79:300 My 8 '15

See also Brass founders' ague

Diseases of metals. See Metals-Diseases

Dishwashing machines
Crescent electric dishwasher, il Elec R & W
Elec'n 66:702-3 Ap 10 '15

Heavy-service electric dish washer, il Elec W  $_{66:1110}$  N 13 '15

Disinfection and disinfectants

Destruction of flies and disinfection. Sci Am

S 80:112 Ag 14 '15

Disinfection of swimming pools with copper sulphate. Sci Am S 80:352 N 27 '15

Steam disinfection for sewage on common carriers, diag Eng Rec 71:43 Ja 9 '15

Sterilizing cutting oils. P. J. Artale. Iron Age 95:482 F 25 '15

Up-to-date disinfection. Sci Am 112:604 Je 19

See also Antiseptics; Ozone

Dislocations

Device for treatment of dislocated and fractured lower limbs. il Sci Am 113:364+ O 23

Dissociation

Can the dissociation theory be applied to solid solutions in steels? E: D. Campbell. Am Chem Soc J 37:2039-46 S '15

Densities and degrees of dissociation of the saturated vapors of the ammonium halides, and the related thermal data. A. Smith and R. H. Lombard. Am Chem Soc J 37:38-70 Ja '15

Dissociation of hydrogen into atoms. I. Lang-muir. Am Chem Soc J 37:417-58 Mr '15

Dissociation of hydrogen into atoms, I. Lang-muir and G. M. J. Mackay, Am Chem Soc J 36:1708-22 Ag '14

Electron conception of valence; the theory of electrolytic dissociation and chemical action. K. G: Falk and J. M. Nelson. Am Chem Soc J 37:1732-48 Jl '15

See also Chemistry, Physical; Electro-chemistry; Electrolysis: Electrolytes; Electrons

Phosphates of 2,3-distearin. R. R. Renshaw and R. R. Stevens. Am Chem Soc J 36:1770-2 Ag '14

Distillation

Adjustable burner support for condensation apparatus. H. E. Bishop. il J Ind & Eng Chem 7:693 Ag '15
Advantageous form of still for the exact measurement of boiling point during fractional distillation. T. W. Richards and F: Barry, il Am Chem Soc J 36:1787-91 Ag '14
Analytical distillation of petroleum. W. F. Rittman and E. W. Dean. diags J Ind & Eng Chem 7:185-95, 754-60 Mr, S '15
Destructive distillation of Pacific coast kelps. D. R. Hoagland. J Ind & Eng Chem 7:673-4
Ag '15
Distillation of water. G. W. McKey in the condensation of statistic contents of the condensation of the

Ag '15
Distillation of water, G. W. McKee, il Am Gas
Light J 102:404-7+ Je 28 '15
Distilled feed water. C. F. Hirshfeld. Eng M
49:724-30 Ag '15
Emergent stem correction for thermometers
in creosote oil distillation flasks. R. M. Wilhelm, diags U S Bur Stand Tech Pa 49:1-21

Experiments on the distillation of liquid air in a magnetic field. R. S. McBride. Am Chem Soc J 37:1715-18 Jl '15 Fractional distillation with regulated still-

Soc J 37:1715-18 Jl '15
Fractional distillation with regulated still-heads: cases in which the boiling-point curve passes through a maximum or a minimum. M. A. Rosanoff and C. W. Bacon. diags Am Chem Soc J 37:301-9 F '15
Fractional distillation with regulated still-heads: distillation of ternary mixtures. M. A. Rosanoff, J: F. W. Schulze, and R. A. Dunphy. Am Chem Soc J 37:1072-9 My '15
Improved form of Kjeldahl distillation apparatus. A. D. Holmes. il diag J Ind & Eng Chem 6:1010-12; 7:693-4 D '14, Ag '15
Kjeldahl distillation apparatus. J. M. Pickel. il J Ind & Eng Chem 7:787-9 S '15
Manufacture of gasoline by cracking heavy oils. Sci Am S 79:283 My 1 '15
Method of finding the partial from the total vapor pressures of binary mixtures, and a theory of fractional distillation. M. A. Rosanoff, C. W. Bacon, and J: F. W. Schulze. Am Chem Soc J 36:1993-2004 O '14
New water still. il diag Met & Chem Eng 12: 796 D '14
Partial vapor pressures of ternary mixtures of tollers.

Partial vapor pressures of ternary mixtures of toluene, carbon tetrachloride and ethylene bromide. M. A. Rosanoff, J. F. W. Schulze, and R. A. Dunphy. Am Chen Soc J 36:2480-95 D '14

95 D '14

Pressure distillation of petroleum hydro-carbons. A. P. Bjerregaard, il diags J Ind & Eng Chem 7:573-7 Jl '15

Separation of gases by fractional distillation in a vacuum at low temperatures. G. A. Burrell and I. W. Robertson. J Ind & Eng Chem 7:209-10 Mr '15

Study of the reaction of alkali salts of sulfonic acids with alkali phenolates by dry distillation. E. H. Nollau and L. C. Daniels. Am Chem Soc J 36:1885-91 S '14

Topping plants of California. A. F. L. Bell. il diags Am Inst Min E Bul 105:1769-99 S '15; Discussion. 108:2426 D '15

Two convenient forms of receiver for frac-

Two convenient forms of receiver for fractional distillations under diminished pressure. M. T. Bogert, diags J Ind & Eng Chem 7:785-6 S '15

Water-distilling apparatus. C. E. Anderson, plan Power 40:856 D 15 '14; Same. Eng & Min J 99:150 Ja 16 '15

Water distilling apparatus. il Met & Chem Eng 13:704 O 1

See also Coal distillation; Coal-tar prod-cts; Essential oils; Peat distillation; Wood distillation

Distilled water. See Water, Distilled

Distortion factors

Distortion factors. F: Bedell, R. Bown and C. L. Swisher. Am Inst E E Pro 34:1059-73 Je '15; Abstract. Elec W 66:7-8 Jl 3 '15

District heating. See Heating from central sta-

District heating association, National. See National district heating association

Dithiourimido-acetylacetone
Constitution of the so-called dithiourimido-acetylacetone. W: J. Hale, Am Chem Soc J 37:1544-52 Je '15

Diving, Submarine

All-metal diving dress. il diags Engineer 118: 554-5 D 11 '14
Deep diving experiments and the records at Honolulu. Eng N 73:796 Ap 22 '15
Effect of pressure on the diver, il Sci Am 113: 61+ Jl 17 '15

Raising the F-4. J. F. Springer, il Sci Am 112:355+ Ap 17 '15
Salvage work on the Empress of Ireland. R. G. Skerrett. il plan diag Int Marine Eng 20: 60-2 F '15

Dixie highway Governors to control Chicago-Miami road. Horseless Age 35:457 Ap 7 '15

Docks

Horseless Age 35:137 Ap 7 '15

Docks

Balboa docks, il Sci Am 112:48 Ja 9 '15

Barge canal terminal, il diags Int Marine Eng 20:114 Mr '15

Concrete cribs used successfully in dock construction at Victoria, il diags plans Eng Rec 72:165-7 Ag 7 '15

Concrete pile and cylinder foundations at Charleston, il diag Eng N 74:926-9 N 11 '15

Jacksonville municipal docks nearing completion. Eng N 74:1099 D 2 '15

Kiel; its naval and engineering features.

A. W. Metcalfe, diags Engineer 120:50-2 Jl 16 '15; Same cond. Sci Am S 80:234 O 9 '15

Municipal dock for St. Louis, Mo. Eng N 74:101 D 2 '15

New coal dock for the Cincinnati, Hamilton & Dayton at Toledo, il plan Ry Age 59:273-4 Ag 13 '15; Same. Ry R 57:236-9 Ag 21 '15; Same cond. Eng Rec 72:163-4 Ag 7 '15

New graving dock at South Shields, il diag plan Engineer 120:154-6, 158 Ag 13 '15

Pearl harbor dry dock, F. R. Harris. Eng Rec 71:57-8 Ja 9 '15

Pearl harbor dry dock; abstract. H. R. Stanford. Am Soc M E J 37:413-14 Jl '15

Pennsylvania coal dock at Sandusky, il plan Ry Age 57:1189-91 D 25 '14

Plan for building Pearl harbor drydock near Honolulu, il Eng Rec 71:32-4 Ja 16 '15; Eng N 73:86-9 Ja 14 '15

Repairs to the gates at the 70-foot entrance to the Tyne docks, il Engineer 120:412, 418

O 29 '15

Toledo coal dock built in record time, il plan

to the 'O 29 '15

Toledo coal dock built in record time, il plan Eng N 74:520-2 S 9 '15 Torpedo-boat berth at the Charleston navy yard, il plan Eng N 74:872-3 N 4 '15 Two new Crandall railway dry docks, il Int Marine Eng 20:166-7 Ap '15

See also Freight handling; Harbors: Ports: Wharves

Domes Concrete dome for the new Technology buildings, Cambridge, Mass. il Eng N 74:385-6 Ag 26 '15

Ag 26 '15
Design of 152-foot steel-framed dome. A. W. Earl and T: F. Chace. il diags Eng Rec 70: 451-4, 482-4 O 24-31 '14; Same. Eng & Contr 42:314-20 S 30 '14
Designing a steel dome for the horticulture palace at the Panama-Pacific international exposition. A. W. Earl and T: F. Chace. diags Eng N 74:208-12 Jl 29 '15
Framing of the dome of the palace of horticulture at the Panama-Pacific international exposition. A. W. Earl and T: F. Chace. il diags Eng N 74:112-15 Jl 15 '15
New Traymore hotel at Atlantic City. il diag Eng N 74:21-2 Jl 1 '15
Octagonal framed dome, San Francisco auditorium. il diags Eng N 73:773-5 Ap 22 '15
See also Roofs

See also Roofs

Domestic appliances Domestic fuel appliances from the consumer's point of view. Am Gas Light J 102:70-1, 74-6 F 1 '15

See also Gas appliances

Science of domestic engineering. T: J. Claffy.
Dom Eng 70:7-8 Ja 2 '15

See also Building; Heating; Lighting;
Plumbing; Sanitary engineering; Ventila-

Domestic engineering (periodical)
25th anniversary of Domestic engineering.
J; K. Allen. Dom Eng 69:386-8 D 26 '14

Domestic science

Measurements for the household il U S Bur Stand Circ 55:1-149 '15; Abstract (Efficiency in the household). H. T. Wade. Sci Am 113: 448-9 N 20 '15

See also Apartment houses; Diet; Electricity in the home; Food; Fuel; Furniture; Gardens; Heating; House decoration; Kitchens; Laundry; Menu cards; Sanitation; Ventila-

Dominican republic

Minerals of Santo Domingo, F. L. Garrison, il Eng & Min J 99:641-4 Ap 10'15

Electric control for doors, il Elec W 66:1049 N

Modern sliding parlor door, C. J. G. Phillips. diags Bldg Age 37:49-51 Je; 29-30 Jl '15 See also Architecture; Screen doors

Doorways

Colonial architecture in Connecticut. W. S. Bessell. il diags Arch Rec 38:672-80 D '15 Door guard for motor trucks. diag Ind Eng 15:72 Ag '15

15:72 Ag '15 Doorway, Bartlet-Atkinson house, Newbury-port, Mass. built in 1805, measured and drawn by G. Robb. Brickb 24:pl 10 O '15 Entrance detail, Escuelas Menores, Salamanca, Spain erected in the XVth century. il Brickb

21:266 N '15 Modern colonial doorways. B. Griswold. il Arch Rec 38:246-52 Ag '15

Dorr agitator

Chem Eng 13:97-8 F '15 Chem Eng 13:97-8 F '15

Dorr classifier

Use of hydrometallurgical apparatus in chemical engineering, J: V. N. Dorr. il dia Met & Chem Eng 13:55-9 Ja '15; Same. Ind & Eng Chem 7:119-22 F '15

Dorr thickener

orr thickener

Arizona copper co.'s Dorr thickener. D; Cole.
il diag Eng & Min J 100:131-4 Jl 24 '15

Intermittent discharge on Dorr thickener. Eng
& Min J 100:639 O 16 '15

Use of hydrometallurgical apparatus in chemical engineering. J; V, N. Dorr. il diag J

Ind & Eng Chem 7:122-6 F '15; Same. Met &
Chem Eng 13:91-4 F '15

Double houses Double house for a 50 ft. lot. il plans Bldg Age 37:42-4 N '15

Douglas fir Distillation of Douglas fir at high tempera-tures. B. Tremper. J Ind & Eng Chem 7: 926-7 N '15

Douglas fir for paving blocks. O. P. M. Goss. Eng N 74:774-6 O 21 '15 Protest against condemnation of treated Douglas fir. H. E. Horrocks. Eng Rec 71:107 Ja 23 '15

Draft

raft
Air intakes increase furnace capacity. diags
Elec Ry J 46:641-2 S 25 '15
Draft in furnaces and flues. E. G. Bailey. diags
Power 42:638-42 N 9 '15
Draft readings on a Stirling boiler. S. H. Viall.
diags Power 41:44-5 Ja 12 '15

Measurement of draft. C. F. Hirshfeld, diags Power 42:370-2 S 14 '15

Study of draft in boilers. C. F. Hirshfeld, diags Power 42:196-7 Ag 10 '15

What causes faulty chimney draft, il diag Metal Work 84:577 N 5 '15 Why's of boiler draft, C. F. Hirshfeld, diags Power 41:675-9 My 18 '15

See also Chimneys; Dampers; Firing; Loco-otives—Draft; Mechanical draft; Mine motives—Draft; Mecha ventilation; Ventilation

Draft, Mechanical. See Mechanical draft

Draft gages
Ellison combination differential draft gage, il
Power 41:229 F 16 '15

Townstiens J. C. Small-

Recording power plant operations. J. C. Smallwood. il diags Eng M 50:41-3 O '15

Draft gears

Cost of maintenance of equipment: a record of the Waugh draft gear. Ry R 56:66-7 Ja 9 '15 Draft gear problem. B. V. Crandall. Ry Age (Mech ed) 88:612-13 D '14 Draft gear problem. E. A. Murray. diag Ry Age (Mech ed) 89:498 O '15 Friction spring draft gear diags Ry Age 58: 832 Ap 16 '15 New York municipal car—draft gear. diags Elec Ry J 44:1380-1 D 26 '14 Record of cost of maintaining car draft appliances. Ry R 56:294 F 27 '15

Draft tubes. See Turbines

Drafting boards

Drafting table for fieldwork. C. P. Bernard, il Eng & Min J 100:394 S 4 '15
Field drafting table. W. L. Webb, diags Eng N 73:828 Ap 29 '15

Method of holding long drawings. J. B. Nelson. diags Mach 22:63 S '15
Simplex parallel attachment, il diag Mach 21:1021-2 Ag '15

Drafting instruments. See Drawing instruments

Drafting instruments. See Drawing instruments
Drafting room practice
Automobile drafting room. E. W. Weaver. il
diags Horseless Age 34:222-4, 256-8, 297-8,
332-5, 368-70 Ag 5-8 2 '14
Camera vs. the pantograph. H. A. Williamson. diags Colliery 35:288-91 Ja '15; Excerpt.
Eng M 48:901-3 Mr '15
Checking drawings—how and why. C: F.
Scribner. Mach 22:143 O '15
Drafting room reforms. E. H. Fish. diags Eng
M 48:752-5 F '15
Sectional views of ribs and symmetrical parts.
C. L. Svensen. diags Mach 21:790-1 Je '15
See also Drawing instruments: Machinery See also Drawing instruments; Machinery —Design; Mechanical drawing

Drafts

Cheques and drafts. S. Walton. J Account 20: 230-3 S

Draftsmen

Underrated contributor to steel construction; the detailer. R. Fleming. Eng N 74:653-4 S

Drain tile

Orain tile

Advertising and selling methods for concrete drain tile manufacturers. J. J. Commons. Concrete Cem 7:27-8 Jl '15

Investigation of the durability of cement drain tile in alkali soils. R. J. Wig and G. M. Williams. diags pls U S Bur Stand Tech Pa 44:1-56 '15; Abstract. J Fr Inst 179:354-6 Mr '15; Abstract. Eng Rec 72:220 Ag 21 '15; Excerpts. Concrete Cem 7:145-7 O '15 Investigation of the effects of alkali on concrete drain tile near Lake Park, Ia. C: E. Sims. Concrete Cem 6:278-81 Je '15 Proposed standard specifications and recommended practice for drain tile and tile drain construction. Eng & Contr 42:181-3 Ag 19 '14

'14
Sewer tile of concrete. B. B. Hood. il Eng & Min J 100:188 Jl 31 '15
Size of drain tile as determined by Maryland experience. J: R. Haswell. Eng & Contr 44:60 Jl 21 '15
Subdrainage of brick-paved streets, Lakewood, Ohio. E. A. Fisher. diags Eng N 74:557-8 S 16 '15

Tile drains instead of small culverts on high ways. F. O. Nelson. Eng N 73:1083-4 Je 3 '1

Drainage

Combination concrete road and flood channel, Los Angeles county, Calif. R. Bennett. il diags Eng N 73:42-3 Ja 7 '15 Construction methods and plant for diversion and drainage works for Little River drain-age district in Missouri. Eng Rec 70:612-14 D 5 '14

14 Cost of and profits from tile underdrains. Marsden. Eng & Contr 44:21-2 Jl 7 '15

Cost of drainage pumping in southern Louisiana. C. W. Okey. Eng N 74:733-5 O 14 '15 Design of drainage ditches, with diagrams. W. H. Poe. Eng & Contr 43:439-41 My 19 '15

Difficulties of drainage-ditch contractors. Eng N 73:632-3 Ap 1 '15 Ditch digging by blasting. F. W. Wilson. il Eng & Contr 44:150 Ag 25 '15

Drainage pumping plant with variable-speed drive, il diags Eng N 74:581-3 S 23 '15 Draining a swamp by air lifts. Eng & Min J 100:402 S 4 '15

100:402 S 4 '15
Draining embankments in Missouri. il Ry Age
58:1438-9 Je 18 '15
Draining land by wells; concrete drain head,
diag Eng N 72:1169 D 10 '14
East side levee and sanitary district. T. N.
Jacob. il diags Assn Eng Soc J 55:1-11 JI '15
Excavating machinery used in land drainage.
D. L. Yarnell, bibliog il diags U S Agric Bul
300:1-39 '15
Excavating plant for beavy drainage work in

300:1-39 '15
Excavating plant for heavy drainage work in Arkansas. il Eng Rec 71:41 Ja 9 '15
Formula for computing the run-off depth to be expected from any simple drainage area. S. W. Frescoln. Eng & Contr 44:22 Jl 7 '15
How Carson lake was drained. H. C. Estep. map Iron Tr R 56:128-9 Ja 14 '15

How Carson lake was drained. H. C. Estep, map fron Tr R 56:128-9 Ja 14 '15
Largest electric drainage pumping plant. A. M. Shaw. Eng N 74:804-5 O 21 '15
Little River drainage district. map Eng N 73:519-21 Mr 18 '15
Maintenance of drainage ditches. Eng N 73: \$\$1-2 My 6 '15
Method and cost of making a drainage survey for the Washington Bayou drainage district, Mississippi. O. W. Melin. map Eng & Contr 44:92-5 Ag 4 '15
Method of computing run-off in draining irrigated lands. H. C. Miller. Eng & Contr 44: 150-1 Ag 25 '15
New type of gate for regulating adjacent water levels operates automatically. diags Eng Rec 71:304-5 Mr 6 '15
Novel method of draining a swamp for an earth fill. il Eng N 74:897 N 4 '15
Plans for a typical condition of Mississippi bottom land drainage. map Eng & Contr 43: 499-1 Je 2 '15

bottom land drainage, map Eng & Contr 43: 490-1 Je 2 '15
Reducing the cost of drainage excavation. Eng Rec 70:693-4 D 26 '14
River improvement for public health reclaims 10,000 acres of fertile land. R. W. Sherman, il map Eng Rec 71:738-9 Je 12 '15
Unwatering Carson lake. L. D. Davenport. il map Eng & Min J 98:1069-70 D 19 '14
Why drainage of irrigated lands is necessary, and how the problem is handled. D. W. Murphy. il Eng Rec 72:36-8 Jl 10 '15; Abstract. Eng M 50:464-5 D '15

See also Drain tile: Irrigation: Mine drain-

See also Drain tile; Irrigation; Mine drainage; Roads—Drainage; Sewerage

Drainage, House

Modern design in house drainage systems. A. J. M'Gookin and W: H. Cramer. diags Metal Work 83:769-71 My 28 '15

Draughting room practice. See Drafting room practice

Drawbacks

More liberal draw 65:254 Ja 23 '15 liberal drawback laws required. Elec W

Drawbridges

Nawbridges
Automatic drawbridge signal, diag Eng Rec
70:680 D 19 '14
Canadian Pacific draw span over the Lachine
canal, il Ry Age 59:239 Ag 6 '15
Center bearing, machinery and gates, Congress street swingbridge, Troy, N. Y. diags
plan Eng N 73:804-5 Ap 29 '15
Congress street bridge across the Hudson
river at Troy, N. Y.; structural features,
H; W. Hodge, diags Eng N 73:574-5 Mr 25
'15

Design, construction and detailed costs of the Richelieu river bridge, Lacolle Junction, Quebec. il diags Eng & Contr 42:542-6, 585-9 D 9, 23 '14
Double-deck swingbridge floated in place. il Eng N 74:437 S 2 '15
Draw span of Harlem river bridge floated to place. il Eng Rec 72:298-9 S 4 '15
Electricity in construction of new Portland, Me., bridge. Elec R & W Elec'n 67:229 Ag 7 '15

Energy required for turning a 310-ft. bridge across the Harlem river. il Elec W 66:867 O

ew bridge of the Chicago, Burlington & Quincy R. R. over the Missouri river at Kan-sas City, Mo. diag Eng & Contr 44:170 S 1 New

Drawbridges—Continued

New swing bridge over the Nile at Cairo. il
diags Engineer 120:270-2, 274 S 17 '15
Removable fixed bridge. il Eng N 73:1226-7 Je
24 '15

Renewing heavy swing span by floating into place; old North Western bridge in Mil-waukee removed and new span weighing 800 tons placed in one day, il plan Ry Age 58:836-8 Ap 16 '15

See also Bridges, Bascule; Bridges, Lift

#### Drawing

See also Architectural drawing; Design, Decorative; Geometrical drawing; Mechani-cal drawing; Perspective; Topographical drawing

Drawing, Mechanical. See Mechanical drawing Drawing, Topographical. See Topographical drawing

Drawing instruments

rawing instruments
Combination drafting instrument. il Iron Age
95:1402 Je 24 '15
Involute gear tooth forming device; simple
method of laying out a templet or forming
cutter. G. Luck. diags Mach 21:716-17 My
'15

Drawing room practice. See Drafting room practice

Dredges

predges and dredging operations. Int Marine Eng 20:238-9 Je '15 Electric hydraulic dredge for Cuyahoga river improvements. H. Fies. il Eng & Contr 43: 110-11 F 3 '15; Same. Int Marine Eng 20: 110-11 F 3 245-6 Je '15

Electric suction dredge with special cutter for gumbo, il Eng N 73:220-1 F 4 '15 Electrically operated hydraulic dredge. Eng N 73:889 My 6.'15; il Int Marine Eng 20:251-2 Jе

Je '15
Flume-type elevator dredges in Alaska. L: H.
Eddy. il Eng & Min J 99:1129-30 Je 26 '15
42-inch hydraulic dredge Foyers. il Int Marine Eng 20:256-7 Je '15
Four-yard government dipper dredges. il Int
Marine Eng 20:247-9 Je '15
Government dredges for improving the Arkansas river. il Int Marine Eng 20:252-3 Je '15
Latest United States dredges. P. M. Bruner.
il Int Marine Eng 20:240-3 Je '15
Most powerful dipper dredge in the world:
Gamboa and Paraiso. il Int Marine Eng 20:
254-5 Je '15
Pump and cutter of electric dredge. il Eng N

204-5 Je 19 Pump and cutter of electric dredge. il Eng N 73:1079 Je 3 '15 Recent Ellicott pipe line and sea-going hy-draulic dredges. il Int Marine Eng 20:253-4

Reconstruction of U. S. dredge Barnard. J. R. Peyton. il Int Marine Eng 20:244 Je '15 Semi-Diesel engines and locomobiles for Alaskan dredges. il Eng & Min J 99:644 Ap 10

Steam-electric-driven dredge for the Philip-pines, il Eng & Min J 99:898-900 My 22 '15 10-yard dipper dredges on the Cape Cod canal, il Int Marine Eng 20:255-6 Je '15

Twin-screw bucket ladder dredger and a sin-gle-screw hopper barge for Tasmania. F. C. Coleman. il Int Marine Eng 20:250-1 Je '15

Typical ships, il plan (supp) Engineer 118:573-D 18

See also Snag boats

Dredging Cost data on the work of improving the Neponset river in Massachusetts. E. M. Blake. il Eng & Contr 43:34-6 Ja 13 '15

Cost of electric dredging for land reclamation, San Diego, Cal. L. R. W. Allison. Eng & San Diego, Cal. L. R. Contr 44:95-6 Ag 4 '15

Dredge dipper rigged as drag. O. S. Proctor. il Eng Rec 71:119-20 Ja 23 '15

Dredging sudd on the river Nile, il Eng N 73:513-14 Mr 18 '15

Dredging work on the Panama canal slides. W. G. Comber, il maps Eng N 73:753-7 Ap 22 '15

Filling and dredging for a Jersey City freight terminal, il diag map Eng N 72:1216-18 D 14

Resoiling dredged areas in Victoria. Eng & Min J 98:1136-7 D 26 '14

See also Gold dredging

Gravel dredge which delivers graded materials. A. Gottschalk, il Eng Rec 70:652 D 12 '14 Minneapolis dredging pump operates electrically, il Eng Rec 72:136-7 JI 31 '15 Oil-engine dipper dredge, il Eng N 73:173 Ja

Special cutter head on dredge working in hard material. J. H. Gandolfo, il Eng N 74:990 N

See also Dredges: Excavating machinery

Drilling and boring (earth and rocks)

Difficulties overcome in sinking a deep well. P. E. Green. diag Eng N 74:450-2 S 2 '15 Drill outfit for light blast holes and for rock soundings. il diags Eng Rec 71:725-6 Je 5

715
Drilling for oil. Sci Am S 80:199 S 25 '15
Drilling 30-in. wells for irrigation. il Eng N 73:924-5 My 13 '15
Evolution of drilling rigs. R. B. Woodworth, il diags Am Inst Min E Bul 107:2247-2312 N

deep bore hole, E. B. Wilson, Colliery

Geary deep bore hole, E. B. Wilson, Colliery 36:90-1 S '15
Improved methods of deep drilling in the Coalinga oil field, California, M. E. Lombardi, il diag Am Inst Min E Bul 98:209-15 F '15
Modern rotary drill, H. R. Hughes, il diags Am Inst Min E Bul 99:629-35 Mr '15; Same cond. Eng N 73:928-9 My 13 '15; Abstract, Ind Eng 15:59-60 F '15; Abstract, Colliery 35:522 My '15; Discussion, Am Inst Min E Bul 101:1162 My '15
Portable drilling rig on road and street work—

Portable drilling rig on road and street work— performance records in cutting trenches and cleaning reservoirs, il Munic Eng 49:123-4 S '15

Rock work in coal mines. il diags Colliery 35: 237-40 D'14 Sampling of churn-drill prospect holes. F: G. Moses. diags Eng & Min J 100:301-4 Ag 21

Scheme of diamond drilling at White Pine. Eng & Min J 100:678 O 23 '15 Subaqueous rock excavation. C: C. Phelps. it diags Eng N 74:968-73, 1020-4, 1062-7 N 18-D 2 '15

D 2 '15 Successful winter drilling on the barge canal. W. R. Brown. diag Eng N 74:266-7 Ag 5 '15 Sullivan air-feed drifter. il Eng & Min J 100: 887 N 27 '15 Tripod for handling long drill-steel. L. B. Reifsneider. il Eng & Min J 99:490 Mr 13

Use of mud-laden water in drilling wells. I. N. Knapp. diags Am Inst Min E Bul 96: 2783-93 D '14; Discussion. 101:1151-7 My '15 Wash borings aid in railroad valuation work, il Eng Rec 71:776 Je 19 '15

See also Rock drills; Shaft sinking

Churn-drilling costs. C. H. Palmer, jr.; H. P. Bowen. Eng & Min J 99:20-1 Ja 2 '15 Churn-drilling costs, Sacramento hill, Arizona. A. Notman. il map Am Inst Min E Bul 104: 1677-90 Ag '15

Comparative costs of rotary and standard drilling, M. L. Requa. Am Inst Min E Bul 98: 217-19 F '15; Summary. Eng N 73:943 My 217-19 13 '15

Cost of drilling with well drilling machines in ore prospecting. C. H. Palmer, jr. Eng & Contr 43:202-3 Mr 3 '15

Drilling costs in potash prospecting. E. E. Free. Eng & Min J 100:108-9 Jl 17 '15

Method and cost of making test borings for the Winnipeg Shoal lake aqueduct. D. L. McLean, il diags Eng & Contr 43:316-18 Ap

cests of rock drills at North Star mine, California. R. H. Bedford and W: Hague. il Am Inst Min E Bul 92:1807-16 Ag '14; Same cond. Eng & Min J 98:255-7 Ag 8 '14; Same cord. Eng Rec 70:374 O 3 '14; Same cond. Eng & Contr 42:463-5 N 11 '14; Excerpt. Eng & Min J 98:439 S 5 11; Discussion. Am Inst Min E Bul 95:2750-1 N '14

Drilling and boring (metal working, etc.)
Cost of drilling anchor-bolt holes for the Quebec bridge, C. C. Phelps, il Eng N 73:219 F

Drill fixtures for motor truck parts. C. T. Schaefer, diags Horseless Age 34:818-19 D 2

Drilling speeds. Mach 21:410-11 Ja '15 Speed record in drilling, il Mach 21:305-6 D

See also Machine shop practice

Drilling and boring machinery
Adjustable-spinale boring machine. il Iron
Age 95:993 My 6 '15
Automatic machine for fluting drills. il Iron
Age 95:720 Ap 1 '15; Iron Tr R 56:680 Ap 1

Automatic power feed drilling machine of the Cincinnati pulley machinery company, il Iron Age 94:1291 D 3 '14

Auxiliary drilling machine heads. il Iron Age 95:291 F 4 '15 Bemis four-spindle drill. il diag Mach 22:154-5

Boring machine for car wheels, il Iron Tr R 55:1180 D 24 '14 Center head boring mill, il Iron Age 95:236-7 Ja 28 '15

Ja 28 13 Clearance drills for counter-sinking holes. J. M. Stabel. Mach 21:1005-6 Ag '15 Close quarter drill. Iron Tr R 57:283 Ag 5 '15 Cotter and keyseat drill, il Ry Age (Mech ed) 89:486 S '15

Doing lathe work on all-geared gang drills, il diags Mach 21:740-2 My '15

Double economy in power feed drill, il Automobile 32:465 Mr 11 '15

Drill jig for machining half holes, diags Mach 21:406 Ja '15 Drill motor extensions, V. T. Kropidlowski,

Drill motor extensions. V. T. Kropidlowski. diags Ry Age (Mech ed) 89:579 N '15
Drill press tools. A. A. Bertrand. diags Mach 21:982 Ag '15
Drilling a deep hole. D. A. Hampson. il diag Mach 21:1012-13 Ag '15
Drilling cotter pin holes. il Mach 21:685 Ap '15
Electrical appliances for workshops. il Engineer 119:546 Je 4 '15
Facing tool for drilling machines. il Iron Age 95:93 Ja 7 '15
Gang dvilling machines.

95:93 Ja 7 '15
Gang drilling machine for structural steel, il
Eng N 74:1056 N 25 '15
Heavy cutting on a boring mill. A. A. Dowd.
diags Iron Tr R 56:281-3 F 4 '15
Heavy duty drill press. il Iron Tr R 56:1107
Je 3 '15

drilling machine, il Iron

eavy duty radial Age 96:237 Jl 29 '1

Heavy multiple drilling machine developed by the National automatic tool company, Rich-mond, Ind. il Iron Age 94:1277 D 3 '14 High speed bench drill. il Ind Eng 14:406-7 O

'14
High-speed drill with greater twist. Iron Age
95:895 Ap 22 '15
High speed radial drill, il Ry Age (Mech ed)
89:595 N '15
How the chisel point of a drill wears. R.
Poliakoff, il Mach 21:567-8 Mr '15
Improved radial drilling machine, made by
Kendall & Gent, itd., Manchester, il Engineer 118:538 D 4 '14,

Langelier shrapnel machines. il Mach 21:674-

5 Ap '15 Locomotive frame drill, il Ry Age (Mech ed) 88:649-50 D '14 Machine for boring driving boxes, E. C. Gaines, il Ry Age (Mech ed) 89:138-9 Mr

Micrometer dials for an old boring mill. W. Whitley, diags Mach 22:62 S '15 National-Acme single and multiple drilling machines. il Mach 22:147-51 O '15

ew portable electric drill. il Elec R & W Elec'n 66:37-8 Ja 2 '15

Niles-Bement-Pond boring mill. il Mach 21: 510-11 F'15; Ry Age (Mech ed) 89:543 O'15 Pipe drilling machines, il Iron Age 94:1490 D 31 '14; Iron Tr R 55:1179 D 24 '14

Portable Scotch radial drilling machine, il Iron Age 96:980 O 28 '15

Quick change sensitive drilling machine. il Iron Age 94:1528 D 31 '14

Quick speed changes in new drill press. il Automobile 32:122 Mr 4 '15
Radial drilling machine of the Willmarth tool works. il Iron Age 94:1487 D 31 '14; Iron Tr R 55:1227-8 D 31 '14; Mach 21:430-1 Ja '15; Ry Age (Mech ed) 89:45-6 Ja '15
Radial drilling machine with 2-ft. arm. il Iron Age 96:923 O 21 '15
Rapid automatic drill. il Iron Tr R 55:1184 D

Reboring air pump cylinders. J. A. Jesson, diag Ry Age (Mech ed) 89:138 Mr '15 Rockford auxiliary drill heads. il Mach 21: 517-18 F '15

Rockford box column upright drilling machine, il Iron Age 96:245 Jl 29 '15; Mach 21:1022-3

Ag 10 Semi-automatic four-spindle drill press, il diag Iron Age 96:744-5 S 30 '15 Sipp machine co.'s sensitive drill press, il Mach 21:427-8 Ja '15 Special system of boring tools, il Iron Age 96:

Test of electric drilling machines. il Iron Age 96:1241 N 25 '15 Tool for reboring cylinders run by air boring machine. W. Bazore. il Eng Rec 72:239 Ag

Twin machines for Packard rear axles. il Automobile 32:684 Ap 15 '15 Twist drill design. E. C. Peck. Mach 22:64 S

wo new electric tools; combination upright drilling and bench grinding machine and high-speed drill, il Iron Age 95:1006-7 My 6

Two useful types of boring-bars. F. Server. diags Mach 22:59 S '15

See also Broaching; Machine tools; Ream-

## Testing

Test of drills for cast iron. A. W. Brayshay. Engineer 119:62 Ja 15 '15

Drinking fountains

rinking fountains
Dispenser for drinking water. R. W. Palmer.
il diag Elec Ry J 46:281 Ag 14 '15
Drinking fountain for a mine. D. E. Charlton.
diag Eng & Min J 100:677-8 0 23 '15
Going after bubbling fountain business. il Metal Work 83:48-9 Ja 1 '15
Inexpensive drinking-fountain guard. il Elec
Ry J 46:156 Jl 24 '15
Sanitary drinking fountain for passenger cars.
il Ry Age (Mech ed) 89:47 Ja '15; Same. Ry
Age 58:139-40 Ja 22 '15
Waste-preventing fountain for drinking and

Waste-preventing fountain for drinking and horse watering, Somerville, Mass. F. E. Merrill. il Eng & Contr 42:490 N 18 '14 Drinking water system. See Water supply for

factories Driving boxes. See Locomotives-Driving boxes

Drop head. See Kubisagari Drops

Laws of efflux of drops from capillary orifices; abstract. E. Vaillant. Am Soc M E J 37: abstract. E. 407-8 Jl '15

Drug trade

British India. U S Sp Cons Rep 72:286-9 '15 War and our chemical industries, C. A. West. J Ind & Eng Chem 7:61-2 Ja '15

Drugs

Contributions of the chemist to the manufac-ture of pharmaceutical products. F. R. El-dred. J Ind & Eng Chem 7:939-40 N '15

See also Drug trade; also special drugs and groups of drugs, e.g. Anesthetics

## Analysis

Studies in synthetic drug analysis. W. O. Emery and S. Palkin. J Ind & Eng Chem 6:665-9, 751-3; 7:519-21 Ag-S '14, Je '15

Studies in synthetic drug analysis; estimation of phenacetin and salol in admixture. W. O. Emery, G. C. Spencer and C. C. LeFebvre. J Ind & Eng Chem 7:681-4 Ag '15

Drunkenness. See Temperance

Drury, F. E. Residence of F. E. Drury, Esq., Cleveland, Ohio. I. T. Frary. il plans Arch Rec 38:601-14 D '15

Dry blast process

ry blast process
Blast-furnace plant auxiliaries and general
arrangement; dry blast. J. E. Johnson, jr.
diags Met & Chem Eng 13:429-39 Jl '15
Thermal principles of the blast furnace. J. E.
Johnson, jr. Met & Chem Eng 13:718-20, 78792, 833-40, 905-10, 954-62 O 15-D 15 '15

Dry cleaning. See Cleaning

Dry docks. See Docks

Dry goods

See also Hosiery; Textile industry and fabrics

Dry rot
Dry rot in factory timbers, F. J. Hoxie. Eng
Rec 71:336-7 Mr 13 '15
Prevention of dry rot in mill buildings, F. J.
Hoxie, il Eng Rec 71:400-1 Mr 27 '15
Protecting wooden buildings from dry rot,
Eng N 73:498 Mr 11 '15

See also Wood preservation

Comparison of the relative drying powers of sulfuric acid, calcium chloride and aluminum trioxide when used in ordinary Scheibler desiccating jars. J. W. Marden and V. Elliott. J Ind & Eng Chem 7:320-1 Ap '15 Drying properties of linseed oil treated with cobalt, lead and manganese elaeostearates. L: E. Wise and R. A. Duncan. J Ind & Eng Chem 7:202-5 Mr '15

How producer gas is used for drying molds and cores and for heating ladles in English foundries: il Foundry 43:229-30 Je '15

Using electricity to dry clothes of outside workers. il Elec W 66:869 O 16 '15

See also Coal drying: Drying apparatus;

See also Coal drying; Drying apparatus; Lumber drying

Drying apparatus

Automatic sand dryer, il Elec Ry J 46:455 S

Automatic sand dryer. Il Elec Ry J 46:455 S 11 '15
Drying high-tension transformers with steam heat diag Elec W 65:676 Mr 13 '15
Drying iron ore on the Mesabi range. E. J. Collins. Eng & Min J 99:696-7 Ap 17 '15
Drying large transformer units electrically. il Elec W 65:736-7 Mr 20 '15
Drying sand in 7-yd, batches. diag Elec Ry J 46:193 Jl 31 '15
Houghton dryer. il Munic J 38:83 Ja 21 '15
Nortolk & Western humidity-controlled dry kiln for lumber. W. H. Lewis. il plans Ry Age (Mech ed) 89:462-4 S '15; Same. Ry Age 59:431-3 S 3 '15
Oli burning sand dryer. F. G. Lister. diags Ry Age (Mech ed) 89:407 Ag '15
Quick-closing door for pressure cylinders. il diag Eng N 73:1064-5 Je 3 '15
Scientific clothes dryer. il Metal Work 83:598
Ap 23 '15
Drying apparatus (for textile fabrics)

Drying apparatus (for textile fabrics)
Electric garment dryer conserves health and
schedules, il Elec Ry J 45:300 F 6 '15
Science and the tariff; apparatus employed
in determining customs duties, E. E., Pickrell, il Sci Am S 79:199 Mr 27 '15
Scientific drying. Textile World 50:110-12 O '15
Scientific drying of textile materials, il Textile World 49:528-9 Ag '15
Thermal efficiency of cloth drying, G. H. Perkins, plan Textile World 48:594-6 Mr '15

Dual personality. See Personality

Dumdum bullets. See Bullets

Dump cars

Comparative cost of handling earth on flat and air dump cars. Ry Age 58:1444 Je 18 '15 Improved turntable for contractor's dump cars. diag Eng N 73:988 My 20 '15 Kangaroo refuse-elevating and dump car. diag Eng N 73:1040 My 27 '15

Two-way dump cars, il Elec Ry J 45:299-300 F 6 '15

Dumping appliances
Ash and refuse dumping board, West 77th st.,
North river, New York city. C. W. Staniford.
diags Eng N 73:166-7 Ja 28 '15

Car dumper at Conneaut, Ohio. il Ry R 57: 276 Ag 28 '15

Car dumping machine with improved features at Conneaut Harbor, Ohio. il plan Ry Age 59:390-2 Ag 27 '15

Car dumping machines on the Hocking Valley Ry.'s coal dock, Toledo, Ohio. il Ry R 56:207 F 13 '15
Rapid car dumping plant, Toledo, O. il Iron Age 95:1388 Je 24 '15
Refuse dumped from the cart to scow without scattering. il Eng Rec 72:315-16 S 11 '15

See also Dump cars

Duplex houses
Two-family frame houses, il plans Bldg Age
37:47-8 S '15
Two-family house built of hollow tile, E. G.
Zorn, il plans Bldg Age 37:47-52 Jl '15

Duplex process. See Steel metallurgy

Durant, Oklahoma

Sewerage

Electrolytic sewage treatment plant at Durant, Oklahoma. W. L. Benham. il diags Munic Eng 49:141-6 O '15

Durax pavement. See Pavements, Granite

Dust

Ust
Dust and bacteria content of city air. M. C.
Whipple. Heat & Ven 12:27-33 S '15
Dust; what it is, what it does. W: Swaine.
Sci Am S 80:102-3 Ag 14 '15
Studies in air cleanliness. G: C. Whipple and
M. C. Whipple. Heat & Ven 12:23-8 J1 '15

See also Coal dust; Rock dust

Dust collectors. See Dust removal

Dust prevention

Dust prevention

Dust prevention and street cleaning. W: H.

Connell. Good Roads n s 9:103-6 Mr 6 '15

Dust suppression and street cleaning in Philadelphia. W: H. Connell. Good Roads n s 10:249-52 N 6 '15; Same abr. Eng & Contr 44: 238-42 S 29 '15

Method of applying oil for dust prevention. Eng & Contr 43:435-6 My 12 '15

Methods of applying tars for dust prevention. Eng & Contr 43:445-6 My 19 '15

Progress reports of experiments in dust prevention and road preservation, 1914. U S Agric Bul 257:1-44 '15

Surface oiling of city streets. T. R. Agg. Munic J 38:653-4 My 13 '15

See also Floors. Concrete

See also Floors, Concrete

Dust removal

ust removal
British Portland cement making machinery,
il diags Engineer 120:104-5 Jl 30 '15
Cloth screen dust arrester, il Foundry 43:331
Ag '15; Iron Age 96:303 Ag 5 '15; Metal Ind
n s 13:341 Ag '15
Cyclone or centrifugal separator designs, diags
Metal Work 84:50-1 Jl 9 '15
Exhaust system in matters shop il Metal Work

Metal Work 84:50-1 Jl 9 '15 Exhaust system in pattern shop, il Metal Work 84:441 O 1 '15 Factory exhaust systems. Metal Work 84:22-3 Jl 2 '15

Fleming dust collecting system. W. C. Hanna. il plan Met & Chem Eng 13:609-12 S 15 '15

How state laws compel removal of dust. H. C. Estep. il Foundry 43:43-51 F '15; Same. Iron Tr R 56:415-22 F 25 '15

Investigations on the nature and elimination of odors and dust from a garbage reduction plant. H. W. Mahr and A. C. Kraft. il diags J Ind & Eng Chem 7:778-85 S '15

Pattern for spiral strips in dust separator. diags Metal Work 84:369-70, 545+ S 17, O 29

Solution of smoke, fume and dust problems by electrical precipitation. L. Bradley. Met & Chem Eng 13:911-14 D 1 '15

Suggestions for installing and testing factory exhaust systems. Heat & Ven 12:47-8 S '15 See also Air washers; Electric precipitation; Waste removal

Dwight-Lloyd process

Mechanical progress of sintering. B. G. Klugh, diags Iron Tr R 57:835-8+ O 28 '15; Same. Iron Age 96:1000-4 O 28 '15; Discussion. H. A. Brassert. Iron Tr R 57:845 O 28 '15; Discussion. R. E. Brooke; H. A. Brassert. Iron Age 96:1004-5+ O 28 '15
Salida smelter. F. D. Weeks. Am Inst Min E Bul 104:1691-5 Ag '15; Excerpts (Dwight-Lloyd sintering practice at Salida, Colo.) Eng & Min J 100:312 Ag 21 '15

Dye houses

Vernouses (Concrete tanks for dye-houses, L. C. Wason; W: M. Kinney, Concrete Cem 6:159 Mr '15 Concrete tanks for dye houses, R. R. Newman, Concrete Cem 7:32 Jl '15

Dye industry

Alternatives in case of a dyestuff famine. Sci Am S 80:192 S 18 '15 American dye making. Textile World 49:275-6

Aniline dye situation. I. F. Stone, Met & Chem Eng 13:663-71 O 1 '15; Excerpts. Textile World 50:67-9 O '15 Artificial organic dyes. Sci Am S 80:141 Ag

British dye scheme criticised, Textile World 49:276-7 My '15

British dye scheme criticised, Textile World 49:276-7 My '15
British national dye scheme. D. G. Anderson. J Ind & Eng Chem 7:538-41 Je '15
Contributions of the chemist to the industrial development of the United States—a record of achievement. B. C. Hesse. J Ind & Eng Chem 7:297-304 Ap '15; Same. Sci Am S 79: 234-5 Ap 10 '15; Abstract. Met & Chem Eng 13:287-8 My '15
Developer situation. Textile World 48:522-3 F

Developer situation. Textile World 48:522-3 F '15
Development of the dye industry. M. L. Crossley. Sci Am 112:57;+ Je 5 '15
Development of the use of natural dyestuffs. E. S. Chapin. Textile World 49:638-9 S '15
Dyestuff famine. T: H. Norton. il Sci Am 113: 400+, 427+ N 6-13 '15
Dyestuff industry. Sci Am S 79:336 My 22 '15
Dyestuff problem in England. Textile World 48:334-6, 383-5 D '14-1a '15
Dyestuff situation. Textile World 48:557-9; 49: 61-3 Mr-Ap '15
Dyestuff situation and its lesson. A. D. Little. J Ind & Eng Chem 7:237-9 Mr '15; Same. Sci Am S 79:278-9 My 1 '15
Dyestuff situation in the United States. T: H. Norton. Textile World 49:307-10 Je '15
Dyestuff situation—much smoke but no fire. Am Gas Light J 103:297 N 8 '15
Dyestuff situation—papers and discussion before the New York section of Society of chemical industry. Met & Chem Eng 13:779-82 N 1 '15

chemical industry. Met & Chem Eng 18:779-82 N 1 '15

Dyestuffs and the Department of commerce.
Textile World 50:147-9 N '15

Dyestuffs for American textile and other industries. T: H. Norton. map U S Bur For & Dom Com 96:1-57 '15

Emergency meeting of hosiery manufacturers.
Textile World 50:63-5 O '15

Facts about the color shortage. Inland Ptr 56:

O '15 Foreign markets for American chemicals. T: H. Norton. Met & Chem Eng 13:760-2 O 15 '15

German investments in the dyestuffs industry.

German investments in the dyestuffs industry. Sci Am S 80:101 Ag 14 '15
Government-owned dyestuff works in Great Britain. Textile World 48:371-3 Ja '15
Hearing on the Paige patent bill. Textile World 48:468-75 F '15
High explosives vs. dyestuffs. Textile World 48:528-9 F '15
Intermediate products for the dye industry. Am Gas Light J 102:139 Mr 1 '15
International chemical industry. Engineer 119: 631-2 Je 25 '15
Lest we forget! Who killed Cock Robin? The U. S. tariff-history of coal-tar dyes. B. C. Hesse. J Ind & Eng Chem 7:694-709 Ag '15; Excerpts. Textile World 49:593-6 S '15
Mobilization of American dye makers. Sci Am 113:392 N 6 '15
Preparing for a famine in dyestuffs. Textile World 49:402-4 Jl '15
Present dyestuff situation. E. C. Klipstein. Textile World 49:185-90 My '15
Printers' colors and war munitions. Inland Ptr 56:337-9 D '15
Proposed British dyestuff industry; a German opinion on Great Britain's prospects. O: N. Witt. Met & Chem Eng 13:246-9 Ap '15
Protection in England. Textile World 48:465-6 F '15
Relation of the dyer World 50:105 & N. 15

elation of the dyer to the manufacturer. F. L. Lotte. Textile World 50:195-6 N '15

Report of committee of the National association of cotton manufacturers on dyestuffs. Textile World 49:211-12 My '15

Secretary Redfield's preliminary report on the artificial dyestuff industry. Textile World 48:571-3 Mr '15

48:571-3 Mr 15
Selected quotations bearing on dye shortage from daily papers Aug. 15, 1914 to Feb. 20, 1915. J Ind & Eng Chem 7:302-4 Ap '15
Synthetic dyestuffs and our explosives. T. J. Parker. J Ind & Eng Chem 7:272-3 Ap '15
Two problems of the coal tar dye industry. B. C. Hesse, Textile World 49:225-8 My '15
Who killed Cock Robin?: notes on the tariff history of coal-tar dyes. Sci Am S 80:135 Ag '28 '15

See also Coal tar colors

Dye testing Paint and dye testing; use of the white flame arc as a standard. W: R. Mott. Sci Am S 80:350-2 N 27 '15

Dyeing machines

Circulating dyeing machine. diags Textile World 49:120-1 Ap '15
Circulating liquor in dyeing machines. diag Textile World 50:113-15 O '15
Dyeing process. diags Textile World 49:364-5
Je '15

Je '15
Giles yarn dyeing machine, diags Textile
World 48:332-4 D '14
Hurricane rotary-circulating machine for
bleaching and dyeing, il Textile World 49:
560 Ag '15
Improved dveing machine, diags Textile
World 48:622 Mr '15
Improved tension device for the Giles dyeing
machine, il Textile World 49:560-1 Ag '15
Klauder-Weldon skein dyeing machine, il Textile World 48:435-8 Ja '15

Dyes and dyeing Available dyestuffs. Textile World 50:231-4 N

'15
Color blending and shade matching. J: Brown. diags Textile World 48:527-8 F '15
Coloring principle of myrica rubra—its azo-, sulfide and nitro-dyestuffs. S. Satow. J Ind & Eng Chem 7:113-15 F '15
Colors for tropical countries. Textile World 48:601 Mr '15
Dye recipes. See monthly numbers of Textile world, beginning December, 1914
Dyeing hair cloth. il Textile World 49:348-9
JE '15

Dyeing Je '15

Je '15
Dyeing hosiery. Textile World 50:98-9 O '15
Dyestuffs for American textile and other industries. T: H. Norton. map U S Bur For
& Dom Com 96:1-57 '15
Logwood dyes. Textile World 49:548-9 Ag '15
Manufacture of Turkey-red oils from fatty
acids. W: J. Schepp. J Ind & Eng Chem 7:
806 S 15
Modern mordant dyeing. Textile World 48:618-

Modern mordant dyeing. Textile World 48:618-20 Mr '15

Natural dves as substitutes for coal tar colors. Textile World 48:236-8, 336-336a, 428-9 N '14-Ja '15.

New process of vat dyeing. Textile World 50: 116-17 O '15

Notes on dyeing oxidation aniline black. Tex-tile World 50:226-8 N '15

Revival of the use of natural dyestuffs, E: S Chapin, J Ind & Eng Chem 7:625-8 Jl '15 Same cond. Textile World 49:219-23 My '15

Staining of cotton and wool mixed goods. Textile World 48:524-6 F '15

Temperature coefficients and the effects of acids, bases and salts in reaction velocities of the triphenylmethane dyes. H. C. Biddle and C. W. Porter. Am Chem Soc J 7:1571-89 of and C

See also Bleaching: Coal-tar colors; Dry-ng; Dye industry; Dyeing machines; Loging: wood

## Cost

Labor cost of dveing cotton yarns, L. J. Matos. Textile World 48:625-6 Mr '15

## Cotton

goods. I Aftertreatment of cotton goods il Textile World 49:458-60 Jl L: J. Matos.

Aniline black on cotton hosiery, E. C. T. Bick, Textile World 48:523-4 F '15

Dyeing of military khaki. Textile World 48: 424-5 Ja '15

Dyes and dyeing—Cotton—Continued
Dyeing with vegetable and mineral dyestuffs.
Textile World 49:549-51 Ag '15
Silicate of soda in dyeing cotton. A. Bolis.
Textile World 49:117-19 Ap '15

Dyeing artificial silks, E. C. T. Bick, Textile World 49:119-20 Ap '15

### Wool

Blacks on medium weight wool goods. Textile
World 48:330-2 D '14
Dyeing and finishing wool fabrics. F. Sadler,
diags Textile World 49:365-8 Je '15
Dyestuffs. See Dye industry; Dyes and dyeing

Dynamics

Apparatus for demonstrating Newton's laws. H. W. Harmon, diag Sci Am S 79:42-3 Ja 16 15

See also Force and energy; Hydrodynamics; Thermodynamics

Dynamite

Dynamite does not shoot down. Colliery 35:

Dynamic does not shoot down. Collery 35: 546-7 My '15

Dynamic safely removed from missed holes with air. Eng Rec 72:303-4 S 4 '15

Explosives used in war and metal mining. P. E. Barbour. Eng & Min J 100:508-11 S 25 '15

Dynamo-electric machines. See Dynamos; Electric motors

Dynamometer cars

Dynamometer car development. Ry R 56:768-9 Je 5 '15

9 Je 5 '15

Dynamometer car for the Japanese government railways. E: C. Schmidt. il plans Ry R 56:182-6 F 6 '15; Same. Ry Age (Meched) 89:66-70 F '15

Dynamometer cars for the Southern railway. il diags plan Ry R 56:583-8 My 1 '15

Dynamometers

Junkers dynamometer, il diags Power 42:447-8 S 28 '15

Dynamos

ynamos
Air cleaning apparatus for the ventilation of generators and transformers. W: Baum. il diags Gen Elec R 18:801-12 Ag '15
Air filters for turbo-generators. il diags Engineer 119:36-7, 81-3 Ja 8, 22 '15
Air-gap flux distribution in dynamo-electric generators. A. Still. diags J Fr Inst 179:21-46 Lg '15'

generators. A. Still. diags J Fr Inst 179:21-46 Ja '15
Analysis of unbalanced three-phase systems. L. G. Stokvis. Elec W 65:1111-15 My 1 '15
Calculation of sudden short circuit phenomena of alternators. N. S. Diamant. diags 6 pls
Am Inst E E Pro 34:2043-79 S '15
Census of generating equipment. Elec W 65: 291-2 Ja 30 '15
Characteristics of the three-wire generator: analysis of its behavior when used as a balancer in a direct-current lighting system.
O. J. Ferguson. diags Elec W 64:1199-1204 D 19 '14
Classification of electromagnetic machinery.

O. J. Ferguson, diags Elec W 64:1199-1204 D 19 '14 Classification of electromagnetic machinery. F. Creedy, diags Am Inst E E Pro 34:1399-1423 J1 '15; Abstract. Elec W 66:62 J1 I0 '15 Currents induced in the shafts of dynamoelectric machines; abstract. P. Girault. Elec W 66:250 J1 31 '15 Delta-cross connections of transformers for parallel operation of two- and three-phase systems. G: P. Roux. diags Am Inst E E Pro 34:1683-94 Ag '15 Designing small dynamos and motors. C: F. Frasas, jr. diags Sci Am S 80:364-6 D 4 '15 Developments in electrical apparatus during 1914. J: Liston. il Gen Elec R 18:30-3 F '15 Diesel engines for generator drive. C: Legrand. Am Inst E E Pro 34:1815-18 Ag '15 Direct-connected exciters. il Elec R & W Elec'n 67:342 Ag 21 '15 Dynamos: inventions. E: Weston. J Ind & Eng Chem 7:250-1 Mr '15 Effect of field-coil reversals. E. C. Parham. Elec W 66:643 S 18 '15 Electric generators. P. M. Heldt. il diags Horseless Age 35:544-8, 578-81 Ap 21-28 '15 Gear-driven continuous current turbo-generator. il Engineer 119:608 Je 18 '15 Heating of generator bearings: Elec R & W Elec'n 66:78-9 Ja 9 '15

How the compounding effect of interpole generator showed up in parallel operation. E. C. Parham. Elec W 66:1206 N 27 '15
Improved ventilation of generator permitted a 28 per cent greater load, diag Elec W 66:976 O 30 '15

28 per cent greater load, diag Elec W 66:976
O 30 '15
Incremental armature copper losses at no-load and armature teeth Eddy-current losses.
A. Press, diags Inst E E J 53:820-3 Je 15 '15
Inherent regulation of synchronous alternating-current generators. A. Still, diags Inst E E J 53:587-97 Ap 15 '15
Large-sized generator for gas-steam set, il Elec W 65:819-20 Mr 27 '15
Laws of induction; abstract. A. E. Clayton, diag Elec W 66:652 S 18 '15
Low-voltage direct-current generators. G. Fox, diag Power 40:804-5 D 8 '14
Mechanical effects of electrical short-circuits. S. H. Weaver. Gen Elec R 18:1066-74 N '15
Mechanical forces in circuits carrying heavy currents: abstract. P. V. Hunter. Elec W 64: 1259 D 26 '14
Parallel operation of alternating current generators driven by internal combustion engines; factors affecting generator design. E. Doherty. Gen Elec R 18:167-73 Mr '15
Parallel operation of frequency changers. G. H. Rettew, diag Gen Elec R 18:836-8 Ag '15
Radio generator for amateurs. F: E. Ward, il

Radio generator for amateurs. F: E. Ward. il Sci Am S 80:36 Jl 17 '15 Space distribution of flux density. A. Still. Elec W 65:1679-82 Je 26 '15 Spray-type air washers and coolers for New York station, il diags Elec W 65:349-50 F 6

Starting an old dynamo. G. E. Miles. Power 41:688-9 My 18 '15 Supplying air to generators at constant temperature and humidity. il diag Elec W 66:92 JJ 10 '15 J1 10

perature and hulmdity, if diag Elec W 66:32 Ji 10 '15
Swiss turbo-generator sets. il Engineer 119: 204-6 F 26 '15
Test for dirt in an air supply, S. A. Moss. il Gen Elec R 18:622-5 Ji '15
Testing the air supplied to turbo-generators. Engineer 120:139-40 Ag 6 '15
Transient phenomena in coils with capacity between turns; abstract, K. W. Wagner. Elec W 65:858-9 Ap 3 '15
Triple-frequency currents in delta-connected generator, diags Elec W 65:1249 My 15 '15
Unequal air gap. P. Justus, diag Power 41: 619 My 4 '15
Ventilating requirements of vertical waterwheel generators. Elec W 66:301 Ag 7 '15
Sec also Armatures; Commutators; Electric motors; Switchboards

## Testing

Efficiency test on a large alternator. J. H. McDougal. Power 41:86-7 Ja 19 '15

Earth

Bearth considered as a heat engine. G: F. Becker, Sci Am S 79:391 Je 19 '15 Electric waves and oscillations; means of investigating the interior of the earth. G. Lembach. Sci Am S 79:154-5 Mr 6 '15 Tides in the earth's crust and the elasticity of the globe. A. Berget, Sci Am S 79:382-3 Je 12 '15

See also Earthquakes; Geological time; Geology

### Rotation

Watching the earth revolve; an apparatus that enables the movements of the earth to be directly studied. A. H. Compton. il Sci Am S 79:196-7 Mr 27'15

Earth, Age of Age of the earth; a defense of Lord Kelvin's theory. F. A. Lindemann. Sci Am S 80:183 S 18 '15

Birth-time of the world: methods of determin-ing its age. J. Joly. Sci Am S 79:77-9 Ja 30

Sea-salt and geologic time. H. S. Shelton. Sci Am S 79:79-80 Ja 30 '15

Earth, Duration of Modern ideas on the end of the world. G. Jau-mann. Sci Am S 79:178-9 Mr 20 '15

Earth, Figure of Deformation of the earth by the moon. O: Klotz. Sci Am S 79:167 Mr 13 '15 Isostasy and mountain building. L. de Marchi. Sci Am S 80:198-9 S 25 '15

Earth pressure

Arched reinforced-concrete conduits designed by the theory of least work. W. M. Smith. Eng Rec 71:648-52 My 22 '15; Discussion. 71: 753 Je 12 '15
Boston foundations. J. R. Worcester. Boston Soc C E J 1:10-13 Ja '14
Data requested on the bearing value of soils. Eng & Contr 43:475 My 26 '15
Distribution of vertical soil pressures; tests at Engineering experiment station of Pennsylvania state college. J. A. Moyer. il Eng Rec 71:330-2 Mr 13 '15
Earth pressures determined by laboratory apparatus. J. H. Smith. diags Eng Rec 72:72
Ji 17 '15
Lateral pressure and resistance of clay. and

Ji 17 '15
Lateral pressure and resistance of clay, and the supporting power of clay foundations. A. L. Bell. Engineer 119:124 Ja 29 '15
Piledriving destroys a tunnel by clay pressure. il Eng N 74:404-5 Ag 26 '15
Soil tests reported and safe underpinning methods in sand described. J. F. Greathead, diags Eng Rec 72:631-3 N 20 '15

Earth slides. See Earthwork-Slides

Earth temperature

Ground temperature variations decrease with depth. E. Lauchli. Eng N 74:510-11 S 9 '15

Earthquakes

arthquakes
Earth tremors on the Rand. A. C. Key. Eng
& Min J 100:833-4 N 20 '15
Earthquake dangers in the United States. Sci
Am 13:266 S 25 '15
Prevision of earthquakes. C: Davison. Sci Am
S 80:98-9 Ag 14 '15
Sakurajima. eruptions and earthquakes. E.
Omori. Sci Am S 79:242-3 Ap 17 '15

See also Italy. Feathquake 1015

Bibliography

See also Italy-Earthquake, 1915

Earthquake literature. Sci Am 113:316 O 9 '15

Earthquakes and building

arthquakes and building
Earthquake-proof concrete tower, San Francisco. Eng N 74:308-9 Ag 12 '15
Earthquake-proof tower. C. Derleth, jr. il
Eng M 49:927 S '15
Imperial valley earthquake tests engineering
works. il Eng N 74:234 Jl 29 '15
Irrigation system unharmed by Imperial valley quake; brick buildings suffer most. il
Eng Rec 72:27-8 Jl 3 '15
Protection from earthquakes. T. Moreux. Sci
Am S 79:90-1 F 6 '15

Earths

Kambara earth and its bleaching action on oils. S. Ueno, diags J Ind & Eng Chem 7: 596-600 Jl '15

Earths, Rare Chemical research on terbium. C. James and D. W. Bissel. Am Chem Soc J 36:2060-6 O

L. M. Dennis and B. J. Lemon. Am Chem Soc J 37:131-7 Ja. '15
Electrolysis of solutions of the rare earths.
L. M. Dennis and P. A. Van der Meulen.
Am Chem Soc J 37:1963-76 S '15
Fractional crystallization of the picrates of the rare earths of the didymium group. L. M. Dennis and F. H. Rhodes. Am Chem Soc J 37:807-15 Ap '15

See also Thoria

Earthwork

Slotted pipe aids placing of hydraulic fill. A. M. Thompson. il Eng Rec 71:534 Ap 24 '15 See also Dams; Dredging; Earth pressure; Embankments; Excavation; Filling; Fortification; Foundations; Grading; Hydraulic excavation; Railroads—Earthwork; Tunnels and tunneling

Comparative cost of handling earth on flat and air dump cars. Ry Age 58:1444 Je 18 '15

Methods and costs of moving earth in southern road construction. N. C. Hughes, jr. Eng N 73:734-5 Ap 15 '15

Slides

Stopping a difficult slide by the use of explosives, il Eng N 74:24 Jl 1 '15 See also Panama canal-Slides

Tables, calculations, etc.

Method of obtaining volumes in railroad or ditch work by diagrams. F. C. Snow. Eng & Contr 43:304 Mr 31 '15
Preliminary estimating of grading simplified. J. M. Brown. Eng Rec 71:610-11 My 15 '15
Simple form for earthwork computations. E. F. Verplanck. Eng N 73:29-30 Ja 7 '15
Table for computing the area of sidehill cuts. Eng N 74:272 Ag 5 '15

East river, New York
Plan for the improvement of Hell Gate, East
river. C. D. Ward, map Sci Am 112:432 My East

East St. Louis, Illinois
Playground for a small city: Jones
W. Webb. il Munic Eng 47:424-6 D'14 park.

Eastern supply association
Meeting, New York city, Feb. 17; list of those
in attendance. Dom Eng 70:282-3 F 27 '15
Summer meeting, Atlantic City, N. J., June
16. Dom Eng 71:377-9 Je 26 '15

Eastland (steamship)

Capsizing of the Eastland, il Eng N 74:225-7 Jl 29 15

Eastland disaster and vessel stability. R. A. Towler. Eng N 74:516-17 S 9 '15 'Engineer's report blames Eastland disaster on poor design, overloading and mishandled ballast. Eng Rec 72:221-2 Ag 21 '15

Ecclesiastical architecture. See Church architec-

Economic conditions

Political economy and the engineer. G: L. Hoxie, Elec W 65:1549-51 Je 12 '15

Economics

See also Banks and banking; Credit; Government ownership; Labor and laboring classes; Monopolies; Profit sharing; Tariff; Trusts, Industrial; Unemployed

Economizers. See Fuel economizers

Eddy-currents

Incremental armature copper losses at no-load and armature teeth Eddy-current losses. A. Press. diags Inst E E J 53:820-3 Je 15 '15

Eddy rings Eddy rings in firetube boilers. Am Soc M E J 37:117 F '15

Edison, Thomas Alva, 1846-Award of the Franklin medal. J Fr Inst 180: 111-14 Jl '15

Celebration of Edison day at Panama-Pacific international exposition and at laboratories in West Orange, N. J. Elec W 66:957-8 O 30 '15

Edison and the invention of the electric incandescent lamp, il Elec R & W Elec'n 67: 676-8 O 9 '15; Same abr. Foundry 43:404 O

Sketch. Eng M 50:199 N '15

Edison illuminating companies, Association of See Association of Edison illuminating companies

Edison phonograph shop, New York city
Edison phonograph shop; heating and ventilation at minimum cost, with ventilation
of soundproof booths. C. E. Daniel. plans
Heat & Ven 12:13-18 Ap '15

Edison plant, West Orange, New Jersey Comments on the Edison fire. Eng N 73:38-40 '15

Ja 7 '15
Concrete construction and the Edison fire.
L. C. Wason. Textile World 48:537-40 F '15
Concrete was melted in Edison fire. il Eng N 73:362-3 F 18 '15
Disastrous fire at Edison factory. il plan Eng Rec 70:660-2 D 19 '14
Fire damages the Edison plant. il Elec W 64: 1132-3 D 12 '14
Fire in the Edison works at West Orange, N. J. il Eng N 72:1233-7 D 17 '14

Edison plant, West Orange, New Jersey—Cont. Hot chemicals and concrete formed slag at Edison fire. Eng Rec 71:184 F 6 '15 Preliminary repair work on the Edison con-crete buildings. il diags Eng N 73:89-91 Ja

Preliminary report of committee on Edison fire, diags plan Eng & Contr 43:193-6 Mr 3 '15

3 16
Preliminary report of committee on Edison fire; findings. Eng & Contr 43:145 F 17 '15; Same. Concrete Cem 6:120-1 Mr '15
Rebuilding Edison's great plant. Sci Am 112:
50 Ja 9 '15

50 Ja 9 '15 Repair of concrete buildings at Edison plant sets precedents in construction work, il diags Eng Rec 71:503-6 Ap 17 '15 Underwriters and fire protection association report on Edison fire, il diag plan Eng Rec 71:239-42 F 20 '15

## Edmonton, Alberta

## Sewerage

Construction plant and methods employed in building a system of concrete block tunnel sewers at Edmonton, Alberta, diags Eng & Contr 43:361-3 Ap 21 '15 Design features of new sewerage works at Ed-monton, diags Eng & Contr 43:400-1 My 5 '15

Education

Address to graduating class, Franklin institute school of mechanic arts. G; A. Hoadley. J Fr Inst 179:587-95 My '15 Educational scrap heap and the blind alley job. L. W. Dooley. Sci Am S 79:170-1 Mr 13 '15; Excerpts. il Sci Am 112:247 Mr 13 '15 See also Evening and continuation schools; Industrial education; Professional education; Scholarships; Trade schools; Vocational education

Germany

War and the school; how the interest of German school children is stimulated, il Sci Am S 80:180 S 18 '15

British India. U S Sp Cons Rep 72:40-6 '15 Educaton, Compulsory. See Compulsory edu-

Education, Industrial. See Industrial education Education, Professional. See Professional educa-

Education of children

Care of exceptionally bright children. M. P. E. Groszmann. Sci Am S 80:171 S 11 '15

Edwards, Edward Edward Edwards and his art. S. H. Horgan, il Inland Ptr 55:516-17 Jl '15

fficiency and standardization, C. B. Auel. Am Ind 16:31-3 N '15
Efficiency system for road contractors. J: H. Hammond. Eng & Contr 43:552-4 Je 23 '15
Personal efficiency. B. L. Winchell. Ry Age 58:191 Ja 29 '15

See also Ability tests; Office management; Scientific management

Efficiency, Industrial

Business efficiency and the human element.
M. Chapman. Metal Work 84:71-2 Jl 16 '15
Drink and work. J. D. Hackett. Iron Age 95:
255 Ja 28 '15

Efficiency—applied common sense and experience. F. C. Schwedtman. Am Ind 15:16-17 F '15

F'15 Efficiency in the brass foundry. W. R. Dean, Metal Ind n s 13:327-9 Ag '15 Efficiency in the plating room. E. P. Later. il Foundry 43:360-5 S'15 Efficiency in the stores department. W. G. Astle. il Elec Ry J 46:906-10 O 30'15 General business efficiency in connection with cotton mill management. J. T. Rose, Textile World 49:190-3 My '15 How to create industrial leaders; chapter from "Industrial leadership." H: L. Gantt. Eng M 50:428-37 D'15 Increased efficiency. A. A. Dowd. Sibley J 29: 157-63 F'15 Industrial leadership. H. L. Gantt. Iron Age 95:196-7 Ja 21'15

Measurement of efficiency, H. L. Gantt. Iron Tr R 55:1131-3 D 17 '14; Same. Ind Eng 14:463-5 D '14; Same. Iron Age 94:1320-1 D 3 '14; Same. Automobile 31:1104-5 D 17 '14; Same cond. Ry Age (Mech ed) 89:249-51 My '15; Same cond. Metal Work 83:725-6 My 21 '15; Abstract. Eng M 48:577-80 Ja '15; Abstract; with discussion. Am Soc M E J 37: 11-13 Ja '15

More about the human factor, D; M. Myers, Eng M 19:301-8 S '15 Retailing steel mill products, il Iron Tr R 56: 65-71 Ja 7 '15 Shop efficiency, G; H. Logan, Ry R 57:464-7

G 9 15 System and its abuse, J: Calder, Iron Age 96: 1043-4 N 4 '15 Systems for the engineer and contractor, T: Barwick, Heat & Ven 11:27-34 N; 15-21 D '14; 12:18-22 Ja '15 Using the electric-power meter to measure wasted production, R. E. Loper, Eng M 49: 231-4 My '15 Waste in the management of public utility

Wasted production, R. E. Loper, Eng M 49: 231-4 My '15
Waste in the management of public utility power plants. F. W. Collins. Eng M 49:888-93 S '15

What is efficiency? R: M. Van Gaasbeek. Am Ind 16:32-3 O '15

Where the money goes. R. O. Wye. Elec R & W Elec'n 65:1210-11 D 26 '14

See also Factory management; Foundry management; Office management; Scientific management; Shop management; Time study

Efflorescence

Cause and prevention of efflorescence. Concrete Cem 7:116-17 S '15

Eggs
Bacteriological and chemical study of commercial eggs in the producing districts of the central West. 8 pls U S Agric Bul 51: 1-77 '14

Eggs, Dried
Egg and albumen industry in China. Am Ind
15:40 F '14

British India, U S Sp Cons Rep 72:428-9 '15

## Eavet

Treasure of Lahun; beautiful jewelry ornaments and tools found in a plundered pyramid, W. M. F. Petrie. il Sci Am S 79:264-5 Ap 24 '15

Ehrlich, Paul, 1854-1915 Discoveries in chemotherapy. Sci Am 113:210

Eight-hour day. See Hours of labor

Ejectors

Squirt hose ejector, diags Ry Age (Mech ed) 89:256 My '15

Ejectors, Sewage. See Sewage ejectors

Elastic deformation. See Deformations (mechanics)

Elastic fabrics

Manufacture of elastic fabrics. S: Brown. il Textile World 46:406-8, 491-4; 47:283-4, 324-6, 592-3; 48:394-7 Ja-F, My-Je, S '14, Ja '15

Elasticity

Bending elasticity of cast iron. A. Ono. Am Soc M E J 37:290-1 My '15

See also Strains and stresses; Strength of materials

Elbows, Pipe. See Pipe elbows

Electric accidents. See Electric shock

Electric alarms

Electric alarm for bevel gear generator. E. K. Morgan, diag Mach 22:232 N '15

Garage alarm. diags Elec R & W Elec'n 66: 387-8 F 27 '15

Motor-driven fire and general alarm siren. il Elec R & W Elec'n 66:40 Ja 2 '15

See also Fire alarms

Electric apparatus, Protective. See Electric protective apparatus

Electric apparatus and appliances
Automatic device for timing relay and fuse
operation, plan Elec W 65:608-9 Mr 6 '15

Electric apparatus and appliances—Continued
Automatic electric elevator dispatcher. N. G.
Meade, diags Power 41:540-1 Ap 20 '15
Carbon as a heating element in appliances.
C. W. Piper. Elec W 66:134-5 Jl 17 '15
Castings as electrical apparatus parts. A. B.
Reynders. Iron Age 94:1496-7 D 31 '14; Abstract (Holding an electrical manufacturer's business). Foundry 43:96-7 Mr '15
Convenient electric soldering iron. J. N. Grahan. diag Elec Ry J 46:66 Jl 10 '15
Current supply for motion picture machines.
H. R. Johnson. il diags Gen Elec R 18:895-904
S '15
Developments in electrical apparatus during

Developments in electrical apparatus during 1914. J: Liston. il Gen Elec R 18:80-93 F '15 Electric bread-pan cleaning and greasing ma-chine, il Elec R & W Elec'n 65:1149 D 12

chine. Il Elec R & W Elec'n 65:1149 D 12
'14
Electric equipment for painting without a
brush. il Elec W 66:1050 N 6 '15
Electric remote gages for shooting ranges. Sci
Am 112:633 + Je 26 '15
Electric well-sounding instrument. L. W.
Stocker. diags Eng N 73:444-6 Mr 4 '15
Electrical appliances for workshops. il Engineer 119:474-6, 546-9, 570-2, 620-2; 120:40-1,
54-6 My 14, Je 4-11, 25, Jl 9-16 '15
Electrical ball pitchers for indoor batting
practice. il Sci Am 113:364 O 23 '15
Electrical long distance transmitting, indicating and recording system. il diags Ind
Eng 14:395-6 O '14; Colliery 35:281-2 D '14;
Heat & Ven 11:57-9 D '14; Mach 21:330-1 D
'14; Met & Chem Eng 12:797-8 D '14; Eng N
72:1136-7 D 3 '14; Elec R & W Elec'n 65:
1100-1 D 5 '14; Power 40:916-17 D 29 '14
Electrical sounding. H: R. Gilson. diags Elec
R & W Elec'n 66:1002-3 My 29 '15; Abstract.
Eng M 49:764 Ag '15
Electrically heated embossing block. il Elec
W 66:995 O 30 '15
Electrically operated chime outfits. il Elec
B & W Elec'n 66:701-2 An 10 '15

Electrically operated chime outfits, il Elec R & W Elec'n 66:701-2 Ap 10 '15 Estimated values of materials for use in clec-trical industry. Elec R & W Elec'n 66:11 Ja

Measuring well-water levels under difficulties. H. W. Keith. diag Eng N 74:1037 N 25 '15 N. E. L. A. committee report on electrical apparatus. Elec W 65:1517 Je 12 '15 Ozone apparatus as a business proposition. Elec R & W Elec'n 66:33-4 Ja 2 '15 Past year in electricity, il Iron Age 95:294-5 F 4 '15

Peerless variable-speed portable electric power equipment. il Elec R & W Elec'n 66:314 F

13 '15
Photoelectric relay. J. Kunz. diag Elec W 66: 934 O 23 '15
Selling lamp-socket appliances; an analysis of eleven years' experience in marketing electric household devices in southern California. S. M. Kennedy. Elec W 65:1412-14 My 29 '15
Smoke recorder and monitor. W. W. Strong. il Power 40:912-13 D 29 '14
Swiyeling attachment plug il Elec B & W.

Swiveling attachment plug. il Elec R & W Elec'n 67:989 N 27 '15 Voting by electrical apparatus. diags Elec R & W Elec'n 66:744-5 Ap 17 '15

Western electric developments in 1914. Elec R & W Elec'n 66:45-7 Ja 2 '15

Westinghouse electric developments in the year 1914. Elec R & W Elec'n 66:43-5 Ja 2

Weston portable electrical testing in ments, il Textile World 50:126-8 O '15

ments. il Textile World 50:126-8 O'15

See also Armatures; Audion; Automobiles—
Electric equipment; Condensers (electricity); Dynamos; Electric batteries; Electric
bells; Electric circuit breakers; Electric
controllers; Electric current rectifiers; Electric equipment; Electric furnaces; Electric
fuses; Electric instruments; Electric maps;
Electric machinery; Electric meters; Electric motors; Electric precipitation; Electric
protective apparatus; Electric railroads—
Equipment and supplies; Electric shops;
Electric shovels; Electric signals; Electric
standards; Electric sterilization; Electric
toys; Electric transformers; Electricity in
mining; Electricity in the home; Electricity
on the farm; Electromagnets; Fans, Elec-

tric; Fessenden oscillator; Fire alarms; Gal-vanometers; Gas and oil engines—Ignition; Induction coils; Oscillators; Phase advanc-ers; Relays; Rheostats; Switchboards; Syn-chroscopes; Telephone

### Exhibitions

Exhibitions

Electrical exposition and motor show of 1915.

Sci Am 113:339+ O 16 '15

General electric company's exhibit at the Panama-Pacific international exposition, il Elec R & W Elec'n 66:132-3 Ja 16 '14

General electric company's exhibits at the Panama-Pacific international exposition.

G: W. Hall, il Gen Elec R 18:561-71 Je '15

Home electrical at San Francisco, il Elec W 65:1125-6 My 1 '15

"Home electrical" at the Panama-Pacific international exposition. D. C. Shafer, il plan

ternational exposition. D. C. Shafer, il plan Gen Elec R 18:572-8 Je '15; Same cond. Elec R & W Elec'n 66:1041-3 Je 5 '15

#### Losses

Core loss in series motor. T. M. Robie. diags Power 41:771-2 Je 8 '15

Electric arc

lectric arc

Arc phenomena. A. G. Collis. il diags Am

Inst E E Pro 34:2081-2100 S '15

Electric arc in vapors and gases at reduced
pressures. W. A. Darrah. il diags Met &
Chem Eng 13:915-18 D 1 '15

Ferro-ilmenite arc on alternating-current
circuits. I. Ladoff. Elec R & W Elec'n 66:
871-2 My 8 '15

Liquefaction of carbon and the temperature
and conditions of the electric arc. Sci Am S
80:319 N 13 '15

Unstable states in arc and glow. W. G. Cady. Met & Chem Eng 13:866-9 N 15 '15; Abstract. Elec W 66:1156-7 N 20 '15 See also Electric lamps, Arc

Electric armatures. See Armatures

## Electric batteries

Battery zincs; some causes of defective service; abstract. R. Job and F. F. White. Ry Age 59:61 Jl 9 '15
Buffer batteries for alternating-current systems; abstract. L. Schroeder. Elec W 65: 788 Mr 27 '15

Constructing selenium cells. Sci Am 112:201 F

27 '15 Construction of selenium cells, S; Wein, Sci Am 112:403 My 1 '15 Depolarization in Le Clanche cells; abstract, M. D. Thompson and E. C. Crocker, Met & Chem Eng 13:319 My '15; Abstract, with dis-cussion, Elec R & W Elec'n 66:821-2 My 1 '15 Galvanic cell that reverses its polarity when illuminated, A. A. Campbell, Sci Am S 80; 68 11 21 '15

illuminated. A. A. Campbell. Sci Am S 80: 66 Jl 31 '15
New form of primary battery. E. Bellini. Elec R & W Elec'n 66:788 Ap 24 '15
New galvanic cell. Sci Am 113:68 Jl 17 '15
New primary battery; development of a cell using lead-mercury and carbon electrodes in sulphuric-nitric acid electrolyte. H. Bellini. Eng M 49:436-7 Je '15
Selenium cell making. Sci Am S 79:187 Mr 20 '15

Weston cells. Elec W 66:652-3 S 18 '15 See also Storage batteries

## Electric bells

Bell-ringing transformers, il diags Elec R & W Elec'n 66:150-1 Ja 23 '15

Electric bells; abstract. C. Turnbull, diag Elec W 66:21 JI 3 '15

Electric boilers. See Boilers-Electric heating

## Electric buses

Double-deck electric buses at Vienna. il Elec Ry J 45:51 Ja 2 '15

New electric omnibus for York, England, il diags Engineer 119:287-8 Mr 19 '15; Abstract, Automobile 32:720 Ap 22 '15

# Electric cables Analysis of cable faults. Elec W 65:116 Ja 9 '15

Cable jointing. il Elec W 64:1111 D 5 '14

Cables. C. J. Beaver. il diags Inst E E J 53: 57-80; Discussion. 53:81-102, 356-73 D 15 '14, Mr 1 '15; Abstract. Elec W 64:1162-3, 1212-13 D 12-19 '14

Electric cables — Continued
Causes of joint failure pointed out to splicers, il Elec W 65:1122-3 My 1 '15
Development of armored cable, H: R. Gilson, il Elec R & W Elec'n 66:1150-1 Je 19 '15
Effect of moisture in the earth on temperature of underground cables, L. E. Imlay, diags Am Inst E E Pro 34:263-70 F '15; Abstract and discussion, Elec R & W Elec'n 66:389-90 F 27 '15; Discussion, Am Inst E E Pro 34:2615-19 N '15

34:2615-19 N '15
Fargo's cable connectors. il Elec W 66:101-2 Jl
10 '15; Ry Age 59:572 S 24 '15
Flexible support for lead-covered cable. diags
Elec Ry J 46:600 S 18 '15
One-piece splicer vs. wrapped joint in feeder
cable splicing practice. S. L. Foster. il Elec
Ry J 46:955-6 N 6 '15
Sag-tension calculations. H. Pender. Elec W
68:244-5 Ag 14 '15

Sag-tension calculations. H. Pender. Elec W 66:344-5 Ag 14 '15
Stee! and bimetallic conductors as a substitute for copper and aluminum. F. W. Esch. Elec W 65:1466-7 Je 5 '15
Steel-reinforced aluminum cables. E. T. Driver and E. V. Pannell. Elec W 66:524-6 S 4 '15

Sterling outlet plate and connector for armored cables, il Elec R & W Elec'n 67:589

S 25 16 Voltage testing of cables. W. I. Middleton and C. L. Dawes. il diag Am Inst E E Pro 33:987-1008 Je '14: Abstract. Elec R & W Elec'n 65:32-3 Jl 4 '14; Discussion. Am Inst E E Pro 34:70-8 Ja '15 Wiping a lead-covered cable. H. E. Weight

'iping a lead-covered cable. H. E. Weig man, il Elec R & W Elec'n 66:901-2 My 15 See also Cables, Submarine; Electric distribution; Electric wire and wiring; Insu-

lation; Telephone cables

Electric cars, See Motor cars (railroad)

Electric cells. See Electric batteries

Electric circuit breakers

Automatic reclosing circuit-breaker, E. C. Raney, diag Power 41:108 Ja 19 '15 Automatic reclosing circuit-breakers, E. C. Raney, il diag Colliery 35:566 My '15 Automatic reclosing circuit-breakers, il diag Elec R & W Elec'n 66:924 My 15 '15; Elec Ry J 45:996 My 22 '15 Converter station of Aluminum company of America, Maryville, Tenn, il Power 41:776-7 La 8 '15

Je 8 '15 Oil circuit-breakers, il Elec R & W Elec'n 66:1171-2 Je 19 '15; Elec W 65:1645 Je 19 '15 Oil circuit breakers: notes on arc phenomena and tendencies in design. K. C. Randall, il Am Inst E E Pro 34:271-83 F '15; Dis-cussion, 34:2573-81 O '15

Electric circuits Equivalence of Wheatstone bridge to three parallel circuits. A. H. Adams. Elec W 66: 406 Ag 21 '15

parallel circuits, A. H. Adams. Elec W 66: 406 Ag 21 '15 Locating faults by the drop-of-potential method. H. S. Percival. Elec R & W Elec'n 67:983-5 N 27 '15 Mechanical forces in circuits carrying heavy currents; abstract. P. V. Hunter. Elec W 64:1259 D 26 '14

See also Electric conductors; Electric currents; Electric distribution; Electric lines; Electric transmission

Electric code. See National electrical code

Electric conductivity
Absolute zero. S. Dushman, Gen Elec R 18:
243-7 Ap '15

243-7 Ap '15
Conductivity and viscosity of solutions of electrolytes in formamid. P. B. Davis, W. S. Putnam and H. C. Jones. il diags J Fr Inst 180:567-601 N '15
Conductivity of metals. J. J. Thomson. Sci Am S 80:114-15 Ag 21 '15
Electric strength of air. J. B. Whitehead. Am Inst E E Pro 34:843-65 My '15; Discussion. 34:2997-3005 D '15
Electrical conductivity imparted to liquid

Electrical conductivity imparted to liquid air by alpha rays. Sci Am S 79:191 Mr 20 '15

Electrical resistance as effected by very low temperatures. Sibley J 29:106-7 Ja '15; Same. Sci Am S 79:82 F 6 '15

Electron theory of electric conduction in met-als. J. P. Minton. Gen Elec R 18:204-9 Mr

High temperature investigation and a study of metallic conduction. E. F. Northrup, J Fr Inst 179:621-62 Je '15; Abstract. Elec W 65:1614-15 Je 19 '15
Methods, data, and new apparatus for measuring electrical conductivity above 1500° C. of vapors at normal pressure. E. F. Northrup. il J Fr Inst 179:337-52 Mr '15 99.84-per-cent-pure iron for electrical purposes. il Elec W 66:213-14 Jl 24 '15
Potential of silver in nonaqueous solutions of silver nitrate. V. L. Gibbons and F. H. Getman. bibliog diags Am Chem Soc J 36:1630-55 Ag '14

silver nitrate. V. L. Gibbons and F. H. Getman. bibliog diags Am Chem Soc J 36:1630-55 Ag '14
Preliminary study of the conductivity of certain organic acids in absolute ethyl alcohol at 15°, 25° and 35°. E. P. Wightman, J. B. Wiesel and H. C. Jones, diags Am Chem Soc J 36:2243-59 N '14
Sensitive criterion of the precision and of constant errors in the conductance data of weak electrolytes, the determination of the molar conductance of organic electrolytes at zero concentration and a study of the correction for the specific conductance of the conductivity of water. C. G. Derick. Am Chem Soc J 36:2268-83 N '14
Studies in conductivity; the conductivity of some formates and of hydrogen chloride in (anhydrous) formic acid; cases of apparent agreement of strong electrolytes with the mass law. H. I. Schlesinger and A. W. Martin. diags Am Chem Soc J 36:1589-1620 Ag '14

Study of alcoholic solutions of cadmium iodide. F: H. Getman and V. L. Gibbons. Am Chem Soc J 37:1990-6 S '15
Sulphur as a conductor. C. A. Butman. Elec

64:1256 D 26

See also Electric conductors; Electric reasurement; Electric resistance; Hall measurement; effect

Electric conductors

Effects of bends on electrical conductors. P. Jackson. Engineer 118:556 D 11 '14; Same. Sci Am S 79:173 Mr 13 '15
Experimental researches on skin effect in conductors. A. E. Kennelly, F. A. Laws and P. H. Pierce. il diags Am Inst E E Pro 34:1749-1809; Bibliog. 1809-14 Ag '15
Receiving-end impedance of a conducting line loaded at both ends. A. E. Kennelly. Elec W 66:182-4 JI 24 '15

See also Electric cables; Electric distribution; Electric transmission; Electric wire and wiring; Lightning conductors

Electric conduits
Conduit wiring on plaster-board partitions and ceilings. G. M. Durfee, diags Elec W 64:1254-5 D 26 '14

5 D 26 '14
Flexible metallic conduit in finished-building wiring. T. Croft. diags Elec R & W Elec'n 66:421-3 Mr 6 '15
Installation of rigid-conduit wiring in finished buildings. T. Croft. diags Elec R & W Elec'n 66:379-82 F 27 '15

Lighting company to use underground conduits of telephone company by rental, Elec R & W Elec'n 66:378 F 27 '15

N. E. L. A. committee report on underground construction, diag Elec W 65:1519-20 Je 12 '15; Elec R & W Elec'n 66:1112-13 Je 12 '15

Outfit for making special conduit bends. Elec R & W Elec'n 67:20 Jl 3 '15

Overhead concrete ducts for a factory obution system. il Elec W 66:1032 N 6

Underground wires on the Panama railroad. il Ry Age 58:451-3 Mr 12 '15

Wiring and conduit work at the Panama-Pa-cific exposition. A. A. Willoughby. il diag Elec R & W Elec'n 67:365-8, 472-4 Ag 28, S

See also Electric cables; Electric conductors; Electric distribution; Electric wire and

Electric contact strips Contact strips for electric signs and lamps. il Elec W 66:603 S 11 '15

Electric contractors—Continucd

Annual convention of New England contractors at Springfield, Mass., Sept. 21-23. Elec R & W Elec'n 67:607-11 O 2 '15

Bookkeeping and cost-keeping for electrical contractors. L: W. Moxey, jr. Elec W 66: 1153-5 N 20 '15

Broadening the contractor; what co-operation between inspector, contractor and journeyman has done in Louisville. Elec W 65: 554-5 F 27 '15

Business hints for contractor and dealer. G. D. Crain, jr. Elec R & W Elec'n 66:682;

Do4-5 F 21 15
Business hints for contractor and dealer.
G. D. Crain, jr. Elec R & W Elec'n 66:682;
67:188-9, 475-6 Ap 10, J1 31, S 11 '15
By-laws of California association. Elec R & W Elec'n 67:841-3 N 6 '15

W Elec'n 67:841-3 N 6 '15
California association of electrical contractors and dealers meeting, San Francisco, Sept. 24, 1915. Elec R & W Elec'n 67:612 O 2 '15
Checking labor estimates in electrical contracting. Elec W 65:554 F 27 '15
Contractor and the automobile. G. D. Crain, ir. Elec R & W Elec'n 66:423-5 Mr 6 '15
Contractors' cost-keeping system. Elec W 65: 797-9 Mr 27 '15
Contractors' office forms and systems. M. J. Lavalle. Elec R & W Elec'n 67:62-3 JI 10 '15

Convenient.

Convenient estimate and proposal sheets. Elec W 65:555-7 F 27 '15 Co-operation between electrical contractors and jobbers. Elec R & W Elec'n 67:843-4 N 6 '15

Co-operation between electrical contractors

6 '15
Co-operation between electrical contractors and jobbers. W. L. Goodwin. Elec R & W Elec'n 67:282-5 Ag 14 '15
Co-operation of the central stations with the electrical contractors and dealers in electrical supplies. S. V. Walton. Elec R & W Elec'n 67:281-2 Ag 14 '15
Doing business on low overhead expense; W. B. Perry electric company, of Brooklyn. Elec W 65:544-6 F 27 '15
Electrical contractors' association of Wisconsin. Elec R & W Elec'n 66:152-3 Ja 23 '15
Estimating, C. R. Kreider. Elec R & W Elec'n 66:196-8 Ja 30 '15
Handling out-of-town work. A. W. Lindgren. Elec R & W Elec'n 67:64 Jl 10 '15
How the contractor can know where he stands. L: W. Moxey, jr. Elec W 66:870-3 O 16 '15

16 '15 L. W. Mozey, Jr. Elec W 60:310-3 O How to estimate cost and keep accounts. J. P. Coghlin. Elec W 66:318 O 9 '15 Illinois contractors hold semi-annual convention. Elec R & W Elec'n 66:154 Ja 23 '15 Insurance saving and concentric wiring discussed by Illinois contractors. Elec W 65: 254-5 Ja 23 '15 Labor costs in interior construction. L: W. Moxey, jr. Elec W 66:924-7 O 23 '15 Massachusetts contractors convene. Elec W 66:773-4 O 2 '15 National electrical contractors' association 15th annual convention. Elec R & W Elec'n

National electrical contractors' association 15th annual convention. Elec R & W Elec'n 67:202-4 Jl 31 '15

New England electrical contractors' convention, Springfield, Mass.; abstracts of papers. Elec W 66:829-30 O 9 '15

Office methods for the electrical contractor. Elec R & W Elec'n 66:550-2 Mr 20 '15

Office system and forms for the electrical contractor. C. M. Converse. Elec R & W Elec'n 67:150-2 Jl 24 '15

Record forms for the electrical contractor. Elec R & W Elec'n 66:724-5 Ap 17 '15

Semi-annual convention of Minnesota electrical contractors' association. Elec R & W Elec'n 66:246 F 6 '15

Sheffield city and electrical contractors. Elec R & W Elec'n 65:1132-3 D 12 '14

Why Jones went broke. Elec R & W Elec'n 66:341-2 F 20 '15

Electric control
Automatic control. C. W. Place. Am Inst E E
Pro 34:2429-35 O '15
Automatic electric control for hydraulic accumulators. il diag Engineer 120:301-2 S

Automatic electric control of pumps. G: J. Kirchgasser. il diags Power 41:811-14 Je 15

Centrally controlled electric haulage systems. F. E. Woodford, il Eng Soc W Pa 31:584-97; Discussion. 31:598-608 O '15

Control and protection of electric systems. C: P. Steinmetz. J Fr Inst 180:1-16 Jl '15; Same. Gen Elec R 18:887-94 S '15; Same cond. Power 42:176-7 Ag 3 '15; Same cond. Sci Am S 80:202-3 S 25 '15
Control for machine-tool motor drives. il Elec W 66:302 Ag 7 '15
Electric control for doors. il Elec W 66:1049

Electric N 6 '15

M o 13 Electro-thermostatic control of radiators. Sci Am 112:364+ Ap 17 '15 Generator control. P. M. Heldt. diags Horse-less Age 35:610-11, 678-9, 708-11 My 5, 19-26 '15

Operating with 5000-volt direct current. N. W. Storer. il diag map Elec Ry J 46:660-3 O

See also Electric controllers; Electric lamps, Tungsten—Control; Electric motors—Control; Electric railroads—Control

Electric controllers

Alternating-current coal hoist. R. E. Brown, il Am Inst E E Pro 34:615-22 Ap '15; Abstract, with discussion. Elec R & W Elec'n 66:781-2 Ap 24 '15; Discussion. Am Inst E E Pro 34:2895-914 N '15

Pro 34:2895-914 N '15
Alternating-current controllers for steel mills.
A. Simon. il diags Am Inst E E Pro 34:73151 My '15; Same. Iron Tr R 57:477-81+, 5279 S 9-16 '15; Abstract. Elec W 65:1195-6 My
8 '15; Discussion. Am Inst E E Pro 34:2895914 N '15
Arc.light. controller.

Arc-light controller for motion picture projection of apparatus. il Sci Am 112:272 Mr 20

Contactor closed and opened. J. A. Horton. diag Power 41:208 F 9 '15
Control of direct current hoists in iron and steel mills. G. E. Stoltz and W. O. Lum. il diag Am Inst E E Pro 34:723-9 My '15; Discussion. 34:2947-65 D '15
Direct-current control for hoisting equipment in industrial plants. W. T. Snyder, diags Am Inst E E Pro 34:695-710 My '15; Same (How to buy hoist controllers). Iron Tr R 56:871-4+ Ap 29 '15; Same cond. Engineer 120:208-10 Ag 27 '15; Abstract, with discussion. Elec R & W Elec'n 66:780-1 Ap 24 '15; Discussion. Am Inst E E Pro 34:2947-65 D '15
Direct-current hoist equipment in industrial plants; discussion at meeting of A. I. E. E.

Direct-current hoist equipment in industrial plants; discussion at meeting of A. I. E. E. Elec W 65:1124 My 1 '15
Electric hatchway control gear for cranes. il diags Engineer 119:476-7 My 14 '15
Industrial control in the foundry. R. H. Mc-lain. il Am Inst E E Pro 34:587-97 Ap '15; Same. Foundry 43:201-3 My '15; Abstract, with discussion. Elec R & W Elec'n 66:777-8 Ap 24 '15; Discussion. Am Inst E E Pro 34:2984-96 'D '15
Mill controllers. H. F. Stratton. Am Inst E E Pro 34:599-614 Ap '15; Same. Iron Tr R 56: 820-4 Ap 22 '15; Abstract, with discussion. Elec R & W Elec'n 66:778-80 Ap 24 '15; Discussion. Am Inst E E Pro 34:2869-94 N '15
Motor control in foundries and steel mills; discussion at meeting of A. I. E. E. Elec W 65: 1081-2 Ap 24 '15
Motor control in steel mills discussed at Pitts.

Motor control in steel mills discussed at Pitts-burgh, Elec R & W Elec'n 66:777-82 Ap 24 '15 Oscillating circuit-controller for railway sig-nal circuits, ii Elec R & W Elec'n 65:1193-4 D 19 '14

4 D 19'14
Selection of electric motors and controllers.
S. H. Libby. Foundry 43:60-3 F '15
Steel mill controllers from the operator's standpoint, J. S. Riggs. Am Inst E E Pro 34: 715-22 My '15; Discussion, 34:2869-94 N '15

See also Electric motors; Rheostats

Electric cooking

Automatic electric cooker for steam cooking on improved fireless principle. il Elec R & W Elec'n 67:249-50 Ag 7 '15
Central-station investment to serve electric-range load. Elec W 66:706 S 25 '15
Cooking with electricity—the other side of the story. Am Cas Light J 103:205 S 27 '15
Economical electric cooking. P. W. Gumaer. diags Eng M 49:580-3 Jl '15
Electric cooking. Elec R & W Elec'n 66:644
Ap 3 '15
Electric cooking and heating in private houses. W. A. Gillott. Inst E E J 53:42-51;
Discussion. 53:51-3, 833-7 D 1 '14, Je 15 '15

Electric cooking —Continued

Electric cooking—Continucd
Electric cooking grows in popularity at Wildwood, Ohio, il Elec W 65:788 Mr 20 '15
Electric cooking in apartment houses, il Elec W 66:982-3 O 30 '15
Electric cooking in Poplar Bluff, Mo. Elec R & W Elec'n 66:239-40 F 6 '15
Electric cooking, mainly from the consumer's point of view. W. R. Cooper, diags Inst E E J 53:473-84; Discussion, 53:484-97, 676-90, 833-7 Ap 1, My 1, Je 15 '15
Electric heating and cooking. P. W. Gumaer, il Sci Am 113:496+ D 4 '15
Eleiminating the coal range from the kitchen, H. C. Spaulding, il Sci Am 112:64 Ja 16 '15
Interesting electric-cooking costs from Germany, Elec W 66:702 S 25 '15
Large electric kitchen; abstract. K. Perlewitz, diag Elec W 64:1115-16 D 5 '14
New possibilities of electric heating and cooking brought out in meeting of British central stations. Elec R & W Elec'n 66:334 F
20 '15
Practical education in electric cooking: domes-

Practical education in electric cooking: domestic science department of the University of New Mexico. H. W. Alexander, il Elec W 65:232-3 Ja 23 15

of New Mexico, H. W. Alexander, it filed W 65:232-3 Ja 23 '15

Promoting electric cooking through the rising generation, it filed W 66:1197-8 N 27 '15

What policy is being adopted by gas companies to meet electric stove competition? V. S. McIntyre, Am Gas Light J 103:220 O

v. S 4 '15

See also Electric ovens: Electric stoves

#### Electric current converters

See also Electric transformers

Electric current rates. See Electric power-Rates

Electric current rates. See Electric power—Rates
Electric current rectifiers
Aluminum rectifier. G. Schulze. Elec W 65:
1552 Je 12 '15
Construction of a vibrating rectifier for charging automobile ignition batteries. C: Fraasa.
diags Sci Am S 80:108-9 Ag 14 '15
Mechanical rectifier for heavy currents. Elec
W 64:1263 D 26 '14
Mercury-arc rectifier for charging small batteries. il Elec R & W Elec'n 67:84 Jl 10 '15;
Elec W 66:102 Jl 10 '15
Mercury vapor rectifier locomotive an accomplished fact. il diag Elec Ry J 44:1343 D 19

New device for rectifying high tension alter-

New device for rectifying high tension alternating currents; the kenotron. S. Dushman, diags Gen Elec R 18:156-67 Mr '15; Abstract. Elec W 65:659-60 Mr 13 '15

Pure electron discharge and its applications in radio telegraphy and telephony. I. Langmuir, diags Gen Elec R 18:332-4 My '15

Small mercury-vapor rectifier for charging automobile lighting batteries. il Elec R & W Elec'n 66:1010 My 29 '15; Automobile 32:904 My 20 '15

Voltages with electrolytic rectifier, diag Elec R & W Elec'n 67:669, 759 O 9, 23 '15

Electric currents

Contact electrification and the electric current. F. Sanford. Sci Am S 80:322-3 N 20 '15 Denatured electric current: an Italian device by which a heating circuit is useless for lighting. G. Pincherle. diag Eng. M 48:739-40

F '15
Distributing potential over a string of insulators. J. L. Brenneman and H. M. Crothers. diags Elec W 64:1095-9 D 5 '14
Growth of current in circuits of negative temperature coefficient of resistance. F. W. Lyle. Gen Elec R 18:1129-30 D '15
Harmonics in transformer magnetizing currents. J. F. Peters. diags Am Inst E E Pro 34:1657-73 Ag '15
Infinite duration of transients. C: L. Clarke. Gen Elec R 18:73 Ja '15
Measuring the current in d. c. circuits. O: A. Knopp. il diags Elec W 66:751-2 O 2 '15
Receiving-end impedance of conducting line loaded at both ends. A. E. Kennelly. Elec W 66:182-4 Jl 24 '15

See also Concrete, Effect of electricity on;

See also Concrete, Effect of electricity on; Eddy-currents; Electric circuits; Electric conductivity; Electric conductors; Electric distribution; Electric measurement; Electric meters; Electric transmission; Electric waves

Electric currents, Alternating
Alternating current electrolysis. J. C. Ghosh, diags Am Chem Soc J 36:2333-46 N '14
Analysis of unbalanced three-phase systems.
L. G. Stokvis. Elec W 65:1111-15 My 1 '15
Analytical and graphical solution ror non-sinusoidal alternating currents. F. M. Mizushi. Am Inst E E Pro 34:1075-86 Je '15;
Abstract. Elec W 66:8 Jl 3 '15
Calculation of sudden short circuit phenomena of alternators. N. S. Diamant. diags 6 pls
Am Inst E E Pro 34:2043-79 S '15
Calibration of current transformers by means of mutual inductance. C: Fortescue. diags pls Am Inst E E Pro 34:1199-1215 Je '15
Distortion of alternating current wave caused by cyclic variation in resistance. F: Bedell and E. C. Mayer. diags Am Inst E E Pro 34:177-86 F '15; Abstract. Elec W 65:472 F 20 '15; Discussion. Am Inst E E Pro 34:

Experimental researches on skin effect in conductors. A. E. Kennelly, F. R. Laws and P. H. Pierce. il diags Am Inst E E Pro 34: 1749-1809; Bibliog. 1809-14 Ag '15 Flow of energy, R. A. Philip, diags Am Inst E E Pro 34:455-84 Ap '15; Same. W Soc E J 20:44-72 My '15; Same cond. Engineer 120: 67-9 Jl 16 '15; Same cond. Power 42:352-5 S 7 '15; Abstract. Elec W 65:1035-6 Ap 24 '15; Discussion. W Soc E J 20:472-7 My '15 Magnetic hehaviour of iron under alternating magnetization of sinusoidal wave-form. N. W. McLachlan. diags Inst E E J 53:809-19 Je 15 '15

Parallel operation of frequency changers, G. H. Rettew, diag Gen Elec R 18:836-8 Ag '15 Producing vector diagrams experimentally; im-

proved apparatus designed to visualize alter-nating-current diagrams. A. E. Kennelly and H. G. Crane. il diags Elec W 65:985-6 Ap 17

Unbroken alternating current for cable telegraphy. G: O. Squier. diags J Fr Inst 180:311nbron raphy. C

What to call alternating-current motors. C. A. Adams. Elec W 66:339 Ag 14 '15 What to call alternating-current motors; discussion. V. A. Fynn; E. Rosenberg. diags Elec W 66:971-5 O 30 '15

See also Electric distribution; Electric waves

Electric discharges

Pure electron discharge and its applications in radio telegraphy and telephony. I. Langmuir. diags Gen Elec R 18:327-39 My '15 Sustained radio-frequency high-voltage discharges. H. J. Ryan and R. G. Marx. Elec R & W Elec'n 67:628 O 2 '15 Unstable states in arc and glow. W. G. Cady. Met & Chem Eng 13:866-9 N 15 '15; Abstract. Elec W 66:1156-7 N 20 '15 See also Cathode rays; Ionization; Radioactivity; X rays

Electric distribution

Alarm arrangement designed for the purpose of indicating grounds, plan Elec W 66:812 O 9 '15

Apparatus for determining voltage at feeder taps in network systems. il Elec W 65:300 Ja 30 '15
Arc phenomena. A. G. Collis. il diags Am Inst E E Pro 34:2081-2100 S '15
Automatic voltage regulators. W. H. Acker. il diags Elec W 65:127-8 Ja 9 '15
Battery reserve in an alternating-current system. diags Elec W 66:465-6 Ag 28 '15
Characteristics of the three-wire generator: analysis of its behavior when used as a balancer in a direct current lighting system. O. J. Ferguson, diags Elec W 64:1199-1204 D 19 '14

19 '14
Converting a distribution system. Elec W 66: 86-7 Jl 10 '15
Distribution system for power purposes: system of the Western Canada power company. F. D. Nims. il Am Inst E E Pro 33:1147-52 Ag '14; Discussion. 34:161-7 Ja '15
Economics of electric railway distribution. H. F. Parshall. Elec Ry J 44:1250 D 5 '14; Same (Substation standardization). Elec R & W Elec'n 65:1147 D 12 '14
Effect of third harmonic in voltage wave. R: C. Powell. diags Elec W 65:157-8 Ja 16 '15

Electric distribution—Continued

Effect of voltage changes on electrical apparatus. Elec W 66:535 S 4 '15

Effects of remote feeder taps on schedule speed. N: Stahl. Elec Ry J 45:991-2 My 22 '15

Electrical equipment of Panama-Pacific exposition, il diags plan Elec W 64:1241-7 D 26

14
Fargo ground points. il Elec R & W Elec'n 67;
250-1 Ag 7 '15
Feeder-tap protection for d.c. apparatus and
a few suggestions regarding the care of
commutators. C: H. Smith. Elec Ry J 45;
627-8 Mr 27 '15
Feeder to be a suggestion of the care of commutators.

Feeder-tap resistance in rotary-converter practice, L. P. Crecelius; E. C. Baugher, Elec Ry J 45:799-800 Ap 24 15

From a.c. to d.c. in the night, il diags Elec Ry J 45:542-50 Mr 20 '15

Ry J 45:542-50 Mr 20 '15 General notes on grounding. H. M. Wolf. Gen Elec R 18:991-5 O '15 Ground interfered with parallel operation. J. E. Kilroy. plan Power 42:203-4 Ag 10 '15 Ground-wire disconnector. il Elec Ry J 46:158 Jl 24 '15

Grounded-secondary systems. Elec W 66:1088 N 13 '15

Grounded-secondary systems. Elec W 66:1088 N 13 '15
Load dispatching system of the Columbus railway, power and light company. H. W. Clapp. il Gen Elec R 17:912-14 S '14
Locating faults by the drop-of-potential method. H. S. Percival. Elec R & W Elec'n 67:983-5 N 27 '15
Motor service in a large bolt factory; electrical distribution system of the Reed & Prince manufacturing company, Worcester, Mass. il diag Elec W 65:1188-91 My 8 '15
N. E. L. A. committee report on grounding secondaries, Elec W 65:1520 Je 12 '15
Part construction plays in getting small loads. il Elec W 66:530-2 S 4 '15
Power distribution on Penn. R. R. at Philadelphia. il plan Power 42:685-6 N 16 '15
Protecting electrical apparatus from self-destruction. Elec Ry J 45:659 Ap 3 '15
Puzzling ground. T: G. Thurston. diag Power 41:342-3 Mr 9 '15
Remotely controlled mock distribution system. il Elec W 65:610 Mr 6 '15
Residential load characteristics. Elec R & W Elec'n 66:946 My 22 '15
Schweitzer automatic instantaneous voltage regulator. diag Elec R & W Elec'n 66:271 F 6 '15

Single-phase loads from polyphase systems. Engineer 120:185-6 Ag 20 '15 Supervising 840 miles of lines; how the load dispatcher of the San Joaquin (Cal.) sys-tem adjusts even plant water supply. L. J. Moore. il map Elec W 65:1422-4 My 29 '15

Supplying of power to the Quaker oats company. J. M. Drabelle. il diag Gen Elec R 18: 42-4 Ja '15

Test of ground plates, Elec R & W Elec'n 67: 566, 669-70 S 25, O 9 '15

Ways of hunting trouble on distribution systems, il diag Elec W 66:579-82, 638-42 S 11-18 '15

Why an induction regulator stuck and how it was repaired. E. C. Parham, Elec W 66: 1147 N 20 '15

Work of the load dispatcher. R. R. Robley, il diag Elec W 65:1418-21 My 29 '15

See also Electric cables; Electric conduc-tors; Electric currents; Electric driving; Electric fuses; Electric power; Electric transformers; Electric transmission; Elec-tric wire and wiring; Rotary converters; Switchboards

Electric driving

Air-lift pumps as a central-station load. Elec R & W Elec'n 66:1191-2 Je 26 '15

Application of electric drive in flour mills and similar industries; abstract. T. E. Simpers. Elec R & W Elec'n 66:192-3 Ja 30'15

Application of electric motors to gold dredges. G. B. Rosenblatt. il diag Am Inst E E Pro 33:1165-76 Ag '14; Abstract. Eng & Min J 98:739-40 O 24 '14; Discussion, Am Inst E E Pro 34:144-54 Ja '15

Application of electric power in a lumber yard, it diag Elec R & W Elec'n 66:400-1 F 27 '15

yard, il diag Elec It & W Elec'n 66:400-1
F 27 '15
Application of electricity to the ore handling industry. C. D. Gilpin, diags Am Inst E E Pro 34:397-415 Mr '15; Abstract. Elec W 65: 996-7 Ap 17 '15
Brick-plant production increased by electric drive, il Elec W 65:794 Mr 27 '15
Buying power for the rolling mill. B. Wiley and W. Sykes. Iron Tr R 57:530-3 S 16 '15
Case where motor drive just suits; application in a shoddy mill. il Elec W 66:415 Ag 21 '15
Characteristics of electric motors involved in their application. D. B. Rushmore, Am Inst E E Pro 34:187-93 F '15; Abstract and discussion. Elec W 65:523 F 27 '15; Discussion. Am Inst E E Pro 34:187-93 F '15; Abstract and discussion. Elec W 65:523 F 27 '15; Discussion. Am Inst E E Pro 34:723-9 My '15; Discussion. 34:2947-85 D '15
Control of direct current hoists in iron and steel mills. G. E. Stoltz and W. O. Lum, il diag Am Inst E E Pro 34:723-9 My '15; Discussion. 34:2947-85 D '15
Cost of electric dredging for land reclamation, San Diego, Cal. L. R. W. Allison, Eng & Contr 44:95-6 Ag 4 '15
Doing it electrically at West Point. J: A. Randolph. il Elec W 66:574-5 S 11 '15
Economics of motor drive. H. F. Stratton. Iron Tr R 55:527-30+ S 17 '14; Same cond. Elec R & W Elec'n 65:827-8 O 24 '14; Abstract. Ind Eng 14:403-6 O '11
Electric drive effects economy in large tire factory. Elec R & W Elec'n 67:104-5 Jl 17
Electric drive for economic operation and

factory. Elec R & W Elec'h 67:102-5 Jl 17

Electric drive for economic operation and development of cement mills. J. B. Porter. Am Soc M E J 37:157-8 Mr '15

Electric drive for grain elevators. Elec R & W Elec'n 66:378 F 27 '15

Electric drive in a cottonseed-oil mill. J. W. Ruff. Elec W 66:978-9 O 30 '15

Electric drive in building construction. il Elec W 65:675 Mr 13 '15

Electric drive in confectionery making. il Elec W 65:791-2 Mr 27 '15

Electric drive supplants steam engine and belt transmission in paper-bag factory. il Elec W 65:935 Ap 10 '15

Electric driving of woolen mills. J. F. Crowley. Ind Eng 15:81-3 Ag '15

Electric motor drive: method of interlocking machines for simultaneous operation in the new plant of the Commercial milling company, Detroit, Mich. il diags plan Elec W 65: 105-9 Ja 9 '15

Electric motor in the printing industry. W. C.

105-9 Ja 9 '15
Electric motor in the printing industry. W. C. Yates, il Gen Elec R 18:1136-42 D '15
Electric motors in the Portland cement industry. Electric power in the machine shop. A. L. De Leeuw. Iron Tr R 57:688-90+ O 7 '15
Electric power in the textile industry. C. A. Chase, il Gen Elec R 18:540-50 Je '15
Electrical construction in machine shops and foundries. N. G. Meade, diags Elec R & W Elec'n 67:16-18 Jl 3 '15
Electrical equipment of the Vermont marble company. J: Liston, il Gen Elec R 18:1015-25
N '15

N '15
Electrical practice in steel mills. D. M. Petty. Iron Tr R 57:941-2 N 11 '15
Electrically driven shingle mill. il Elec R & W Elec'n 66:1122-3 Je 12 '15
Electrically operated brick factory at Springfield, Ill. il Elec W 65:671-3 Mr 13 '15
Electrically operated coal plant. il Elec W 65:994-5 Ap 17 '15
Electrically operated contractor's plant for building Kensico dam. A. W. Carroll. il Eng Rec 71:18-20 Ja 2 '15
Electrically operated phonograph. il diag Elec W 65:1180 Je 5 '15
Electricity for municipal pumping. il Elec R

Electricativ operated phonograph. If diag Elec W 65:1480 Je 5 '15
Electricity for municipal pumping, il Elec R & W Elec'n 67:653-6 O 9 '15
Electricity in a cold-storage plant, il Elec R & W Elec'n 67:357-9 Ag 28 '15

Electricity in a Massachusetts shoe fact T: D. Bond. il Elec W 66:88-90 Jl 10 '15

Electricity in a modern saw mill. il Elec R & W Elec'n 66:290-2 F 13 '15

Electricity in a wholesale grocery establishment. il Elec R & W Elec'n 67:503-6 S 18 '15 Electricity in an automobile assembling plant. il Elec R & W Elec'n 66:329-31 F 20 '15

Electric driving —Continued

Electricity in an ore-treating plant, il Elec R
& W Elec'n 66:481-4 Mr 13 '15

Electricity in bakeries, il Elec R & W Elec'n
66:715-21 Ap 17 '15

Electricity in breweries, il Elec R & W Elec'n
66:1143-6 Je 19 '15

Electricity in brick-making, il Elec R & W
Elec'n 66:65-9 Ja 9 '15

Electricity in cement manufacture, N. G.
Meade, il Elec R & W Elec'n 67:273-5 Ag
14 '15

Electricity in chair manufacturing, il Elec R

14 '15
Electricity in chair manufacturing. il Elec R
& W Elec'n 66:979-82 My 29 '15
Electricity in cotton duck mills. il Elec R &
W Elec'n 66:673-9 Ap 10 '15
Electricity in cotton gins. J. H. Moseley. il
Elec R & W Elec'n 67:139-45 J1 24 '15
Electricity in hardware manufacturing. il Elec
R & W Elec'n 66:801-6 My 1 '15
Electricity in hardware manufacturing. il Elec
R & W Elec'n 66:801-6 My 1 '15
Electricity in harvesting machinery works. il
Elec R & W Elec'n 67:745-50, 883-8 O 23,
N 13 '15

Elec R & N 13 '15

N 13 '15
Electricity in ice-cream manufacture, il Elec R & W Elec'n 66:413-15 Mr 6 '15
Electricity in ice-cream manufacturing, il Elec R & W Elec'n 67:55-7 Jl 10 '15
Electricity in implement manufacturing, W. J. Kyle, il Elec R & W Elec'n 67:97-101 Jl 17

'15
Electricity in large steel warehouses, il Elec It & W Elec'n 67:463-5 S 11 '15
Electricity in laundries, il Elec R & W Elec'n 66:617-20 Ap 3 '15
Electricity in lime manufacture, A. C. Hewitt, il Elec R & W Elec'n 67:181-4 Jl 31 '15
Electricity in magazine publishing, il Elec R & W Elec'n 66:105-7 Ja 16 '15
Electricity in malting houses: relative merits of isolated-plant and central-station service, il Elec R & W Elec'n 65:1123-8 D 12 '14
Electricity in manufacture of wood-pulp paper, il Elec R & W Elec'n 67:223-6 Ag 7 '15
Electricity in manufacturing, Power 40:901-2 D 22 '14

Electricity in manufacturing. Power 40:901-2 D 22 '14

Electricity in marble quarrying. il Elec R & W Elec'n 67:963-6 N 27 '15

Electricity in packing plants. il Elec R & W Elec'n 66:445-8 Ja 23 '15

Electricity in paper making. W. B. Conant. il Elec R & W Elec'n 66:371-5 F 27 '15

Electricity in printing plants. il Elec R & W Elec'n 66:851-5 My 8 '15

Electricity in ruther mills. il Elec R & W Elec'n 66:573-9 Mr 27 '15

Electricity in sand and gravel plants. il Elec R & W Elec'n 67:599-602 O 2 '15

Electricity in stone quarries and asphalt plants. il Elec R & W Elec'n 67:599-602 O 30 '15

Electricity in textile mills. il Elec R & W Elec'n 67:315-18 Ag 21 '15

Electricity in textile mills. il Elec R & W Elec'n 67:315-18 Ng 21 '15

Electricity in the largest lumber mill; Weyerhaeuser co., Everett, Wash. A. H. Onstad. il Elec W 66:1080-1 N 13 '15

Electricity in the lumber industry. E. F. Whitney, il diasp plans Am Inst E E Pro 33: 1823-62 D '14; Discussion. 34:439-51 Mr '15

Electricity in the manufacture of electricity machinery. il Elec R & W Elec'n 66:287-9 F 13 '15

Electricity in the publishing business. il Elec

Electricity in the publishing business. il Elec R & W Elec'n 65:1069-72 D 5 '14 Electricity in twine and rope mills. il Elec R & W Elec'n 67:551-4 S 25 '15

Electricity in waterworks plants. L. E. Darling. Elec R & W Elec'n 66:869-71 My 8 '15

Electricity in woodworking plants, il Elec R & W Elec'n 66:893-7 My 15 '15

Electricity saves paper mill \$400 a month. il Elec W 65:673 Mr 13 '15

Electrification of mills at Bombay. Elec R & W Elec'n 66:984 My 29 '15

Electrified milk-distributing depot using central station service, il Elec W 66:650 S 18 '15

Factors involved in motor applications; outline. D: B. Rushmore. Am Inst E E Pro 34: 417-19 Mr '15; Discussion. 34:2666-746 N '15 Fields of motor application. D: B. Rushmore. Am Inst E E Pro 34:1105-13 Je '15; Discussion. 34:3006-52 D '15

Fireclay company, Denver, increases profits by use of central-station service. Elec R & W Elec'n 67:604 O 2 '15

Fractional horse power motor load. B. Lester. il Am Inst E E Pro 34:385-95 Mr '15; Same cond. Eng M 49:268-71 My '15; Abstract. Power 41:589-96 Ap 27 '15; Discussion. G. H. Garcelon. Am Inst E E Pro 34:2653-5 N '15 Hamilton electric inchne railway. il Elec Ry J 46:115-16 Jl 17 '15; Same. Eng N 74:49-51 Jl 8 '15; Same, Ry R 57:213-14 Ag 14 '15 Heavy electric reversing mills. W. Sykes. il Iron Tr R 55:1181-3+ D 24 '14 How electricity is used in handling sea-food. il Elec W 66:450-1 Ag 28 '15 How one operator controlled an air-compressor motor and used it to drive a direct-current generator. H. R. Smith. diags Elec W 66:168 Ag 28 '15 Improving motor drive in a corset factory, il

G6:16N Ag 2N 15
Improving motor drive in a corset factory, il Elec W 65:1252 My 15 '15
Individual motor drive in pen and pencil factory, il Elec W 65:110 Ja 9 '15
Industrial applications of electricity. A. R. Bush. il Gen Elec R 18:460-82 Je '15
Large electric hoist. W. Sykes. il diags Am Inst E E Pro 34:1819-27 Ag '15
Large steel-mill motor drive. il Elec W 66: 1089-90 N 13 '15
Motor drive adopted for compressors and other equipment in Reading (Pa.) ice plant. A. L. Hart. il Elec W 66:1147-8 N 20 '15
Motor drive for a Bradley helve hammer. W. E. Johnston. il diags Ry Age (Mech ed) 89: 184 Ap '15
Motor drive in a rock-drill factory. F. D. Burr.

184 Ap '15 Motor drive in a rock-drill factory. F. D. Burr, il Elec W 65:1700-1 Je 26 '15 Motor drive in marble works. il Elec W 65:1192

My 8 '15
Motor-driven, high-pressure gas pumping installation. J. S. Haug. Am Gas Light J 103: 315-16 N 15 '15
Motor driving in European cement works. il Elec R & W Elec'n 66:1050-1 Je 5 '15
Motor service in a large bolt factory; electrical distribution system of the Reed & Prince manufacturing company, Worcester, Mass. il diag Elec W 65:1188-91 My 8 '15
Motor sizes for flour-mill machinery. Elec W 65:418-19 F 13 '15; Same cond. Ind Eng 15: 83-4 Ag '15
Motors operating 3600 r.p.m. directly connected to woodworking surfaces. il Elec

Motors operating 3600 r.p.m. directly connected to woodworking surfaces. il Elec W 66:643-4 S 18 '15 Motors show saving in replacing gasoline engines in brickyard. il Elec W 66:258 Jl 31

Motors simplify operations in milk depot. J. L. Wiltse. il Elec W 66:363-5 Ag 14 '15 Need of studying energy consumption of manufacturing operations. Elec W 66:144 Jl 17

Operating factory motors, S. P. Goodale, il diag Elec W 66:533-4 S 4 '15
Plant problem solved by purchased service; American manufacturing company, Brooklyn, il Elec W 66:628-33 S 18 '15
Reversing motor planer drive, il Ind Eng 14: 455-6 D '14

455-5 D 14 Selection and application of motors. G. Fox. Elec R & W Elec'n 66:348-50 F 20 '15 Use of current for operating crane to remove trucks from under car bodies. R. E. Hewitt. il Elec Ry J 46:638 S 25 '15

Use of electricity in a newspaper plant; motor and control equipment for production of New York times. il Elec W 65:1627-31 Je 15

See also Electric distribution; Electric motors; Electric power; Electric transmission; Electricity in refrigeration; Power transmission

Electric elevators. See Elevators, Electric

Electric engineering

Advances in electricity, il Power 42:366-8 S 14

m. Inst. E. E. midwinter convention, New York city, February 17-19, 1915. Elec R & W Elec'n 66:389-96 F 27 '15

Am. Inst. E. E. Panama-Pacific convention, San Francisco, September 16-18. Elec R & W Elec'n 67:567-73 S 25 '15

Am. Inst. E. E. 32d annual convention, Deer Park, Md., June 29-July 2; abstracts of papers and discussions. Elec R & W Elec'n 67:69-75 Jl 10 '15

Electric engineering—Continued

Am. Inst. E. E. 32d annual convention, Deer
Park, Md., June 29-July 2; abstracts of
papers and discussions. Elec W 66:6-11, 62-3-10

Applied electrical science in 1914. A. E. Kennelly. Elec W 65:4-5 Ja 2 '15; Same. Sci Am S 79:51 Ja 23 '15

S 19:51 Ja 25 19 Birmingham local section; chairman's address. A. H. Railing. Inst E E J 53:263-8 F 1 '15 Electrical developments. J: Snell. Elec R & W Elec'n 65:1097 D 5 '14

Electrical engineering and race progress. Sci Am S 79:307 My 15 '15
Electrical engineering problems. R. G. Hudson and W. V. Lyon. See weekly numbers of Electrical review and western electrician Electrical papers at Manchester meeting of British association for the advancement of science. Elec R & W Elec'n 67:672-6 O 9 '15 Electricity in the construction and operation of the Panama canal. E: Schildhauer, il diags Gen Elec R 18:sup679-780 Jl '15 Inaugural address of president. J: Snell. Inst E E J 53:1-13 D 1 '14 Indexing of electrical engineering subjects. Elec W 65:1026-7, 1229 Ap 24, My 15 '15 International engineering congress; discussions on subjects pertaining to the electri-

International engineering congress; discussions on subjects pertaining to the electrical industry. Elec W 66:732-4 O 2 '15
International engineering congress; report of electrical and related sessions, San Francisco, Sept. 20-25. Elec R & W Elec'n 67: 614-18 O 2 '15
Minnesota electrical association 8th annual convention. Elec R & W Elec'n 66:637-41 Ap 2 '15

3 '15
New England question box convention. Elec
R & W Elec'n 66:537-40, 598-600 Mr 20-27 '15
Proposed changes in the code to be considered
by electrical committee. Elec R & W Elec'n
66:337-40 F 20 '15
Recent electrical progress. Engineer 119:11-12,

Recent electrical progress. Engineer 119:11-12, 33-5 Ja 1-8 '15
Review of the year 1914: electricity. Sci Am 112:7 Ja 2 '15
Trend of electrical development. P. M. Lincoln. Am Inst E E Pro 34:1491-1502 Ag '15; Same. Gen Elec R 18:784-9 Ag '15; Abstract. Sci Am S 80:282-3 O 30 '15
When electricity was really in its infancy. F. B. Crocker. il Sci Am 112:487 My 29 '15
Wisconsin electrical association. Elec R & W Elec'n 66:26-9 Ja 30 '15

Elec'n 66:206-9 Ja 30 '15

See also Armatures; Commutation (electricity); Dynamos; Electric apparatus and appliances; Electric contractors; Electric distribution; Electric driving; Electric heating; Electric lipting; Electric lines; Electric machinery; Electric measurement; Electric meters; Electric mors; Electric transmission; Electric railroads; Electric transmission; Electric wire and wiring; Electricity; Electric tricity in construction work; Electricity in mining; Electricity in war; Electricity on ships; Electricity on the farm; Hydroelectric plants; Railroads—Electrification; Telegraph; Telephone; Wireless telegraph

## Examinations

Examination papers set at the associate membership examination of the Institution of electrical engineers, April, 1915. Inst E E J 53:748-55 My 15 '15

#### Laws and regulations

Comparative insulation requirements in the United States and European countries. Elec R & W Elec'n 65:1133 D 12 '14 Construction details of temporary motor installations. Elec R & W Elec'n 65:1089 D 5 '14 Electrical code and license law for New York. Elec W 66:103 JI 10 '15 Electrician's residual to the comparation of the comparation

Electrician's registration bill becomes law in Massachusetts. Elec R & W Elec'n 66:1151-2 Je 19 '15

Installation rules for gas-filled incandescent lamps. Elec R & W Elec'n 67:896 N 13 '15

Massachusetts electricians' licensing bill, Elec W 65:1575 Je 12 '15

New electrical code for New York. Elec R & W Elec'n 67:756-7 O 23 '15

New electrical rules in Springfield, Mass. Elec R & W Elec'n 66:425 Mr 6 '15

Wisconsin commission to adopt standards of electrical construction and operation. Elec W 66:909 O 23 '15

Wisconsin standards of electrical construction and operation. Elec R & W Elec'n 67:796 O 30 '15

See also Electric inspection; Electric wire and wiring

# Safety devices and measures

Safety devices and measures

Changes in National electrical code. Elec W 65:878-80 Ap 3 '15

Defense of the Safety code. E. B. Rosa. Elec Ry J 45:939-41 My 15 '15

Electrical safety rules issued. S. W. Stratton. Elec W 65:1102-5 My 1 '15

Improvements in linemen's protectors. il Elec W 65:743-4 Mr 20 '15

National electrical code amended at conference in New York city. Elec R & W Elec'n 66:624-8 Ap 3 '15

National electrical safety code. E: B. Rosa. Elec W 65:845-7 Ap 3 '15

National electrical safety rules. E: B. Rosa. Elec W 65:915-17 Ap 10 '15; Same. Elec Ry J 45:750-1 Ap 17 '15

Precautions to be observed in inserting cartridge fuses. T. H. Reardon. diags Elec R & W Elec'n 66:683-4 Ap 10 '15

Proposed national electrical safety code; preliminary edition. U S Bur Stand Circ 54:1-137 Ap '15

Safeguarding electrical installation. E. H. Worts for Tr. P. 56:575 S 29 '15

137 Ap '15
Safeguarding electrical installation, E. H,
Wentz. Iron Tr R 57:575 S 23 '15
Safety rules to be observed in the operation
and maintenance of electrical equipment and
lines. U S Bur Stand Circ 49:1-50 '14;
Abstract. Elec R & W Elec'n 65:418-19 Ag 29
'14; Abstract. J Fr Inst 178:350-4 S '14;
Abstract. Power 40:806-7 D 8 '14
Taking no chances with electricity, W. Greenwood. Iron Tr R 57:535-6 S 16 '15
Wisconsin considers safety rules. Elec W 66:
959-60 O 30 '15
Work of Bureau of standards on safety rules
for electrical practice. S. W. Stratton. Elec
W 64:1188-9 D 19 '14
See also Electric protective apparatus

See also Electric protective apparatus

# Study and teaching

Apprentice system at the Lynn works of the General electric company. T. Bodde. Gen Elec R 18:35-7 Ja '15

R 18:35-7 Ja 15 New advanced course in electrical engineering at Columbia university, W. I. Slichter. it Gen Elec R 18:940-4 O '15 Statistics of electrical engineering courses. Elec W 66:852 O 16 '15

See also Chicago central station institute

Electric engineers

Address to the students' section of the Institution of electrical engineers. J: Snell. Inst E E J 53:757-62 Je 1 '15
Electrical graduates in 1914: statistics. Elec W 64:1135 D 12 '14
Trained man and his opportunity discussed by Minnesota engineers and Jovians. Elec R & W Elec'n 65:1143 D 12 '14

Electric equipment

Electrical construction details of Butler brothers building, Chicago, N. G. Meade, il diags Elec R & W Elec'n 66:1183-90 Je 26

215
Electrical equipment and efficient features of the new office building of the Hartford electric light company. il diag Elec W 65: 206-9 Ja 23 '15
Electrical equipment of Belmont tunnel cars. il Elec Ry J 45:764-5 Ap 17 '15
Electrical service in furniture store of the Paine furniture company, Boston. il Elec W 65:674-5 Mr 13 '15
Equipment of large publishing house; nower

Equipment of large publishing house; power plant, interior wiring and special features of the Curtis publishing company's building, Independence square, Philadelphia, il diags plans Elec W 65:905-11 Ap 10 '15

Use of electricity in a dental infirmary, il Elec W 66:202-4 Jl 24 '15

See also Automobiles—Electric equipment; Electric apparatus and appliances; Electri-city on ships; Garages, Electric; Railroads— Electric equipment

Electric fans. See Fans, Electric

Electric fittings

Benjamin outlet-box fittings and fixtures. il Elec R & W Elec'n 67:558 S 25 '15 Pagrip metal molding and fittings therefor. il Elec R & W Elec'n 66:786-7 Ap 24 '15

Electric flatirons. See Electric irons

Electric furnaces

Aluminium nitride. diag Met & Chem Eng

Aluminum intries. das 13:504 Ag '15.

Big electric induction furnaces built in 1914, il Iron Tr R 56:335-6 F 11 '15

Buffalo electric steel foundry. H. C. Estep. il plan Iron Tr R 56:215-19 Ja 28 '15; Same. Foundry 43:1-5 Ja '15

Commercial applications of resistance furnaces; abstract. C. W. Bartlett. Elec W

Commercial applications of resistance furnaces; abstract, C. W. Bartlett, Elec W 65:1526 Je 12 '15
Comparative furnace efficiency. R. J. Weitlaner, Met & Chem Eng 13:357-61 Je '15
Cost of electric furnace steel; experience with the Snyder furnace, F. T. Snyder, il diag Iron Age 96:226-8 O 21 '15
Developments in electric brass furnace melting; new type to utilize the pinch effect. G. H. Clamer and C. Hering, il diag Foundry 42:487-90 D '14; Same cond. Iron Age 94:1492-5 D 31 '14; Abstract. Ind Eng 15:56-7 F '15
Developments in electrical apparatus during 1914, J. Liston, il Gen Elec R 18:59-90 F '15
Electric annealing furnaces. Iron Age 95:1017
My 6 '15
Electric furnace and the melting of alloys.

My 6 '15
Electric furnace and the melting of alloys.
R. S. Wile. Iron Age 95:1068-9 My 13 '15
Electric furnace electrodes—their manufacture
and use. C: A. Barnett. il diags Sibley J
30:27-32 O '15
Electric furnace for gold refining at the Alaska-Treadwell cyanide plant. W. P. Lass. il
diag Am Inst Min E Bul 103:1443-7 J1 '15;
Same. Met & Chem Eng 13:566-7 S 1 '15;
Excerpt (Electric precipitate-melting furnace) Eng & Min J 100:270-1 Ag 14 '15:
Abstracts. Elec W 66:251 Jl 31 '15; Eng M
50:456-8 D '15; Discussion. Am Inst Min E Bul
108:2456-8 D '15; Electric furnace for reheating, heat treating

108:2456-8 D '15
Electric furnace for reheating, heat treating and annealing, T. F. Baily. Eng Soc W Pa 31:255-72 Ap '15; Same. Met & Chem Eng 13:558-64 S I '15; Same cond. Ry Age (Mech ed) 89:481-2 S '15; Abstract. Am Soc M E J 37:415-16 JI '15; Excerpt (Heating scaking pits by electricity) Iron Tr R 57:405 Ag 26 '15; Discussion. Eng Soc W Pa 31:272-83 Ap '15

26 '15: Discussion. Eng Soc W Pa 31:272-83 Ap '15
Electric furnace in metallurgical work. D. A. Lyon, R. M. Keeney, and J. F. Cullen. bibliog diags U S Bur Mines Bul 77:1-207 '14; Excerpts (Electric smelting of ferro-alloys). Iron Tr R 56:717-22+, 765-7+, 862-7+, 972-5 Ap 8-15, 29, My 13 '15
Electric furnace in the foundry. W: G. Kranz. Am Inst Min E Bul 101:927-30 My '15; Same. Foundry 43:164-5 Ap '15; Same. Iron Age 95:780-1 Ap 8 '15: Same. Met & Chem Eng 13:656-6 S 1 '15; Discussion. N. Petinot. Am Inst Min E Bul 108:2507-11 D '15; Same. Met & Chem Eng 13:650-6 O 1 '15
Electric furnace in the foundry. J. H. Gray. diags Iron Age 96:798-800, 878-81 O 7-14 '15
Electric furnace in the foundry. R. C. Gosrow. Met & Chem Eng 13:882-3 D 1 '15
Electric furnace in the foundry. W. L. Morrison. Iron Tr R 57:177-9 J1 22 '15
Electric furnace power loads; abstract. F. T. Snyder. Elec R & W Elec'n 67:13-14 J1 3 '15
Electric-furnace steels for dynamic stresses. J. E: Schipper, il diags Automobile 33:865-9 N 11 '15
Electric furno-ore smelting in Norway. diags Elec R & W Elec'n 67:54 J1 10 '15

N 11 '15
Electric iron-ore smelting in Norway. diags
Elec R & W Elec'n 67:54 Jl 10 '15
Electric muffle furnace for the determination
of carbon and oxygen in steel and tungsten
powder. C: M. Johnson. il Met & Chem Eng
13:17 Ja '15
Electric pig iron in Norway: a new type of
furnace using coke successfully—cost data.
diags Iron Age 95:1120 My 20 '15
Electric steel. F. T. Snyder. il diags Iron Tr
R 55:1077-82+, 1127-30+ D 10-17 '14
Electric steel direct from ore fines. A C. Dal-

Electric steel direct from ore fines. A. C. Dalton, Iron Age 96:1184-5 N 18 '15

Electric steel furnace. P. H. Berggreen. Sibley

Electric steel furnace. P. H. Berggreen. Sibley J 29:133 Ja '15 Electric steel furnace of new design; the Wile arc type. R. S. Wile. il diags Iron Age 96: 866-8 O 14 '15 Electric steel in Germany and Austria. Met & Chem Eng 13:398 Je '15 Electric steel industry's present status. Iron Age 95:94-8 Ja 7 '15 Electric steel-making furnaces. T. D. Robertson. diags Inst E E J 53:533-9 Ap 1 '15; Abstract. Elec R & W Elec'n 66:308-9 F 13 '15; Discussion. Inst E E J 53:533-44 Ap 1 '15 Electric steel production. Eng & Min J 100; 224 Ag 7 '15 Electrical steel by the acid process; abstract. A. Müller. Met & Chem Eng 13:640 S 15 '15 Electro-metallurgical industries as possible consumers of electric power. D. A. Lyon and R. M. Keeney. Am Inst Min E Bul 104:1707-30 Ag '15; Excerpts. Iron Age 96:360-2 Ag 12 '15

Tib Evolution of the electric furnace, K. G: Frank, Iron Tr R 57:901-3 N 4 '15 Fusibility of coal ash in various atmospheres, A. C. Fieldner and A. E. Hall, diags J Ind & Eng Chem 7:404, 474-81 My-Je '15 Heat losses from an electric furnace, W. H. Wills and A. H. Schuyler, Iron Age 96:1052-3 N 4 '15

N 4 '15
Heat treatment in automatic electric furnaces; with discussion. T. F. Baily. Iron Age 96: 993-5 O 28 '15; Same cond. Iron Tr R 57:833, 856 O 28 '15

Heroult furnaces for foundry use, il diags Iron Tr R 56:976-8 My 13 '15; Same, Foundry 43: 225-7 Je '15

225-7 Je '15

High temperature experimental furnace. W. R. Malm, diag Met & Chem Eng 13:70 F '15

Improved laboratory furnace. C: M. Johnson. ii Iron Tr R 56:6i8-14 Mr 25 '15

Limitations of the electric furnace in the manufacture of steel castings. E. F. Lake. Met & Chem Eng 13:137-8 Mr '15

Limitations of the electric furnace in the manufacture of steel castings G. Muntz. Met & Chem Eng 13:108-10 F '15

Making steel by electricity. diags Sci Am S 79:206-7 Mr 27 '15

Manufacture of electric steel in the Stobie furnace. V: Stobie. Engineer 119:616-17 Je 18 '15; Excerpt. Iron Age 95:1171 My 27 '15

New nitrogen fixation furnace. diags Eng M 49:104-5 Ap '15

Open hearth versus the electric furnace in the manufacture of commercial steels. S. Corvell

Open hearth versus the electric furnace in the manufacture of commercial steels. S. Cornell. Met & Chem Eng 13:630-1 S 15 '15 Power consumption of electric furnaces. W. L. Morrison. Iron Age 94:1402-3 D 17 '14 Progress in the iron and steel industry and the electric furnace. K. G. Frank. Am Inst E E Pro 34:2547-54 O '15 Quick heating electric furnace for the determination of carbon in steel, etc., with train. C: M. Johnson, il J Ind & Eng Chem 7:960 N '15

Rennerfelt electric furnace, diags Eng & Min J 99:400-2 F 27 '15; J Ind & Eng Chem 7:159 F '15; Met & Chem Eng 13:702-3 O 1 '15 Results of electric-furnace operation in Alaska-Treadwell gold mine. Elec R & W Elec'n 67:987 N 27 '15 Smelting of copper ores in the electric furnace. D. A. Lyon and R. M. Keeney. diags U S Bur Mines Bul 81:1-76 '15 Stassano arc-furnace operation at Redondo, Cal.; abstract. W. M. McKnight. Elec W 65: 1527 Je 12 '15 Steel making in the electric furnace. J. H. Gray. Iron Age 96:1238-9 N 25 '15; Excerpts. Met & Chem Eng 13:656-7 O 1 '15

Thermal efficiency of the electric furnace. W. M. Johnson. Eng Soc W Pa 31:488-98 JI '15; Excerpt. Iron Tr R 57:491 S 9 '15: Dis-cussion. Eng Soc W Pa 31:499-509 JI '15

Use of electricity in melting brass. H. G. Dorsey, il diag Iron Tr R 57:319-20+ Ag 12

See also Electric heating: Electrometallurgy

Bibliography

Electric furnace in metallurgical work. D. Lyon, R. M. Keeney, and J. F. Cullen, U. Bur Mines Bul 77:190-207 '14

Electric fuses
Brooklyn company employs porcelain-clad
high-tension fuses. il Elec W 65:350 F 6 '15
Controversy over refillable fuses. Elec W 66:
126 Jl 17 '15

Hearing on renewable fuses. Elec R & W Elec'n 67:108-9 Jl 17 '15

High-potential pole-type cut-out, il Elec W 66:823-4 O 9 '15

Electric garages. See Garages, Electric

Electric generators. See Dynamos

Electric hammers
Operation of the Western electric hammer.
diag Elec R & W Elec'n 67:858-9 N 6 '15

Electric heaters

Another electrical adjunct to the gasoline automobile. il Elec W 66:981 O 30 '15

Apfel electric heaters. il Heat & Ven 12:56 Mr

Electric air warmers, il Elec R & W Elec'n  $_{67:442~S~4}$   $^{\prime}$   $^{\prime}$   $^{\prime}$  15 Electric heater for shrink fits, il Elec Ry J  $_{46:960-1}$  N  $_{6}$   $^{\prime}$   $^{\prime}$  15

heater to prevent gasoline automo-Electric heater to prevent gasoline automobiles from freezing in cold garages. il Elec R & W Elec'n 67:989 N 27'15
Electric heating and electric heater control. W: S. Hammond, jr. il diags Am Soc Heat & V E 20:279-93'14

& V E 20:279-93 '14 Light-weight all-steel panel heater. il diag Elec Ry J 46:773 O 9 '15 Radiant electric heater. il Elec W 66:768 O 2

See also Electric water heaters

See also Electric water heaters

Electric heating
Developments in electric heating for shoemaking machinery. Elec W 66:816 O 9 '15
Electric cooking and heating in private houses; with discussion. W. A. Gillott. Inst E. E. J 53:42-35 D 1 '14
Electric heating and cooking. P. W. Gumaer. il Sci Am 113:496+ D 4 '15
Electric heating and electric heater control. W: S. Hammond, jr. il diags Am Soc Heat & V E 20:270-23 '11
Electric heating and heat storage; abstract. M. Semenza. Elec R & W Elec'n 67:430 S 4 '15

Electric heating and heating appliances. C. P. Randolph. il Gen Elec R 18:523-6 Je '15 Electric-heating appliance salesroom. il Elec W 65:800-3 Mr 27 '15 Electric heating as applied to marine service. C. S. McDowell and D. M. Mahood. Am Inst E E Pro 33:861-72 Je '14; Discussion. 33:1891-5 D '14

Electric heating in Seattle. il Heat & Ven 12:25-7 Ja '15

12:25-7 Ja '15
Electric-heating resistors; abstract. Lach. il
Elec W 66:76-7 Jl 10 '15
Further developments of electric heating in
Seattle, il Heat & Ven 12:42-3 Mr '15
Heating and ventilating an office building by
electricity: Hydraulic power co.'s plant at
Niagara Falls. C. F. Herington, il diags plan
Heat & Ven 12:13-22 Je '15
Heating and electric heating and

leating and ventilating an office building by electricity: Hydraulic power co.'s plant at Niagara Falls. C. F. Herington, il diags plan Heat & Ven 12:13-22 Je '15 lew possibilities of electric heating and cooking brought out in meeting of British central stations. Elec R & W Elec'n 66:334 F 20 '15 court of electric heating deviage.

F 20 '15
Operating costs of electric heating devices.
Heat & Ven 12:59 Ap '15
Practical aspects of electric heating. Heat & Ven 11:27-9 D '14
Sales arguments for electrically heated japanning ovens. D. Rollins. Elec W 65:43-4 Ja 2

Stockholm investigation on electric heating; abstract. C. A. Rossander. Elec W 65:165 Ja

udy of car-heating requirements. Elec Ry J 45:103-4 Ja 9 '15 Study

See also Boilers—Electric heating; Electric furnaces; Electric heaters; Electric water heaters

Electric heating association, Industrial. See Industrial electric heating association

Electric industries

Business hints for dealer and contractor.

G. D. Crain, jr. Elec R & W Elec'n 67:324-5

Ag 21 '15

Copper and the electrical industry, il Elec W 66:1017-19 N 6 '15

Electric power industry. D: B. Rushmore. il map Gen Elec R 18:427-39 Je '15
Electrical merchant—who will he be? E. E. Whitehorne. il Elec W 66:97-701 S 25 '15
Federal trade commission investigates the foreign market for American electrical goods. W. Fawcett. Elec R & W Elec'n 67: 292-4 Ag 14 '15
Guaranteeing sales on a money-back basis. W. N. Matthews. Elec W 66:10809 Mr 27 15
Interesting the non-electrical public. F. H. Gale. il Elec W 66:1036-7 N 6 '15
Place of the middleman—the jobber. W. R. Herstein. Elec W 66:1036-7 N 6 '15
Supplies; devices and appliances for the distribution, control and utilization of electricity. S. H. Blake. Gen Elec R 18:553-5 Je '15
Thirty-five years of lamp sales. Elec W 66: 860-1 O 16 '15; Abstract. Illum Engr 8:456-7 N '15

Year in the electrical industry. Elec R & W Elec'n 66:5-13 Ja 2 '15

See also Electric contractors; Electric plants; Electric power; Electric service companies; Electric shops; Electric vehicle industry; Electrochemistry; Electrometallurgy; also Electrical prosperity week; National association of manufacturers of electrical

#### Brazil

Electrical opportunities in Brazil. H. N. Douth-itt. Elec W 65:1598; 66:156-7, 425-6 Je 19, Jl 17, Ag 21 '15

# Great Britain

Development of the supply of electricity in Great Britain, A. H. Seabrook, Elec R & W Elec'n 66:761-3 Ap 24 '15
Electrical affairs in Great Britain during 1914, A. H. Bridge, Elec R & W Elec'n 66:13-16
Ja 2 '15

Electrical industry in England in 1914. H. Harrison. Elec W 65:8-9, 974 Ja 2, Ap 17 '15

# India

British India. U S Sp Cons Rep 72:85-99 '15 Calcutta local section; chairman's address, W. H. Everett. Inst E E J 53:466-70 Mr 15

Development of electric power for industrial purposes in India. H. R. Speyer. Inst E E J 53:597-604 Ap 15 '15

# Russia

Electrical development in Russia. L. W. Schmidt. Elec W 65:1719-20 Je 26 '15 Installations, systems and appliances. P. Gurewitsch. Elec W 65:1465-6 Je 5 '15

# Siberia

Opportunities for electrical manufacturers in Siberia. Elec W 65:267 Ja 23 '15

# South America

Electrical conditions in Buenos Aires and Argentina. Elec R & W Elec'n 66:124-6 Ja 16 15

Trade opportunities in South America. Elec W 64:1172-3 D 12 '14

# Switzerland

Foreign business of the Swiss electrical industry for 1914 compared with preceding year. Elec W 66:1131 N 20 '15

# United States

American electrical industries in 1914, T. C. Martin. Elec W 65:3 Ja 2 '15 Continued gain in light and power industry. Elec W 66:456-8 Ag 28 '15

Elec W 66:456-8 Ag 28 '15
Electric supply company, Memphis, Tenn. il
Elec R & W Elec'n 66:526-7 Mr 20 '15
Electrical exports for May. Elec R & W
Elec'n 67:180 Jl 31 '15
Electrical industry and the war. S. Z. Mitchell;
H. M. Byllesby; S: T. Bodine. Elec W 66:
398-9 Ag 21 '15
Electrical exports of the electrical export business.

Future prospects of the electrical export business. M. A. Oudin, Elec W 65:14-15 12 2 2 ness. M. A. Oudin. Elec W 65:14-15 Ja 2'15 How is business? comment by manufacturers. Elec R & W Elec'n 67:413-16 S 4 '15

ncrease in alternating-current service in New York, J. F. Becker, Elec W 65:568 F 27 Increase

Electric industries—United States—Continued
National electrical week, S. M. Kennedy. Elec
W 65:588-9 Mr 6 '15
New England contractors and central-station
men hold co-operative meeting. Elec R &
W Elec'n 66:898-9 My 15 '15
Ohio electric light association meeting of the
committee on new business co-operation.
Elec R & W Elec'n 67:555-6 S 25 '15
Outlook in other industries; comment by editors of various trade publications. Elec R &
W Elec'n 67:417-27 S 4 '15
Society for electrical development, annual
meeting, New York, May 11. Elec W 65:
1265-6 My 15 '15
Statistics in the census returns. Elec W 65:93
Ja 9 '15

Ja 9 '15
Suggested national electrical week, Elec W
65:183, 276-8 Ja 16, 30 '15
Suggestion advanced for a national electrical
week, Elec R & W Elec'n 66:170 Ja 23 '15
Supply manufacturers organize. Elec W 65:
693-4 Mr 13 '15
Western electric company's annual electrical
supply year book, Elec R & W Elec'n 66:42-3
Ja 2 '15

Electric inspection
Electrical inspector, his work and his standard.
T: H: Day. Elec R & W Elec'n 66:117-18 Ja
16, '15

Problems in electrical inspection at the Pana

ma-Pacific international exposition. G. A. Cleary. Elec R & W Elec'n 67:22-4 Jl 3 '15 western association of electrical inspectors 10th annual meeting, Minneapolis, Minn., Jan. 26. Elec R & W Elec'n 66:257-61 F 6 '15

Electric instruments

Electrical measuring in Stand Circ 20:1-57 '15 instruments. U S Bur

See also Electric apparatus and appliances; lectric measurement; Electric meters; Electric measurement; Electric m Electric testing; Electrodynamometers

Electric insulation. See Insulation

Electric irons

Almost a ton of evidence, il Elec W 66:475 Ag

Automatic electric iron for window display. F. D. Burr, Elec R & W Elec'n 66:485 Mr 13

Electric iron with heat intensified at point. il Elec W 66:1218 N 27 '15 Flatiron sold every seven seconds. Elec W 66: 200-1 Jl 24 '15

Electric laboratories

nproved electrical laboratory apparatus. C: M. Johnson. il J Ind & Eng Chem 7:960-1 N '15 Improved

N '15
Industrial research. L. A. Hawkins, il Gen
Elec R 18:416-27 Je '15
Life-testing equipment for tungsten lamps;
electrical features of the incandescent lamptesting laboratory at Nela Park, Cleveland,
il plan Elec W 66:12-16 Jl 3 '15
Recent researches in electricity at the Bureau
of standards. E. B. Rosa, il plan J Fr Inst
180:539-59 N '15
'Onavite artificial transmission line C. F.

180:553-59 N 15 10-mile artificial transmission line. C. E: Magnusson, J. Gooderham and R. Rader. il diags Elec W 65:1545-9 Je 12 '15

Electric lamp socket appliances. See Electric apparatus and appliances

Electric lamps

Arc lamps Arc lamps versus half-watt tungsten lamps; abstract. A. Chevalier. Elec W 66:75 Jl 10 '15 Arc light; the incandescent lamp. E: Weston. J Ind & Eng Chem 7:251-2 Mr '15 Business hints for dealer and contractor. G. D. Crain, jr. Elec R & W Elec'n 67:932-3 N 20 '15

Census returns on electric lamps. Elec W 65:

Census returns on electric lamps 343-4 F 6 '15
Cleveland lantern for ornamental lighting. W. Harrison. il Elec W 66:521-4 S 4 '15
Color of illuminants; with discussion. L. A. Jones. diag Illum Eng Soc 9:687-709 no 8 '14

Comparative cost of magnetite-arc and nitrogen-filled tungsten street-lighting units. J. H. Loban. Elec W 66:109 Jl 10 '15

Edward Weston's inventions. L. H. Baekeland, por Sci Am S 79:108-9 F 13 '15

Electric incandescent lamps. Illum Engr 7:513-14, 547-8 N-D '14

Electric lamp industry. G. F. Morrison. il Gen Elec R 18:497-503 Je '15 Experiments on the heating of screw-socket lampholders. C. C. Paterson. il diags Inst E E J 53:17-21 D 1 '14 Gaseous-conductor lamp for color matching; abstracts. D. M. Moore. diags Elec W 66: 1160 N 20 '15; Elec R & W Elec'n 67:949 N 20 '15; Met & Chem Eng 13:885 D 1 '15 Incandescent versus arc lamps. Elec W 65: 898-9 Ap 10 '15

Incandescent versus arc lamps. H. E. Clifford. Elec W 65:1594-5 Je 19 '15 Indicating key socket. il Elec R & W Elec'n 65:1098 D 5 '14

Moore light in Spain. il Illum Engr 8:324-6 Jl

1B. L. A. lamp committee report. Elec W 65:1520-1 Je 12 '15 . E. L. A. lamp committee report. G. F. Morrison. Gen Elec R 18:925-8 S '15 eon light tubes. J. Boyer. il Sci Am S 78:410 D 26 '14

D 26 '14
Photographic value of various illuminants.
Illum Engr 8:347 Ag '15
Portable electric reading lamp which the carpenter can make, E: H. Crussell. il diags
Bldg Age 37:45-8 D '15
Selecting lighting units on the basis of results.
C. H. Champion. Elec W 65:1028-9 Ap 24 '15
Year in the electrical industry. Elec R & W
Elec'n 66:9-10 Ja 2 '15

See also Electric lanterns; Electric light fixtures; Electric lighting; Locomotive headlights; Safety lamps, Electric; Searchlights

Testing

Lamp-testing instruments. il Elec W 66:423 Ag 21 '15
Street-illumination tests; committee report.
Elec W 65:1521-2 Je 12 '15

Electric lamps, Arc

Arc lamps; committee report. Illum Eng Soc 10:525-7 no 7 '15; Same. Illum Engr 8:445-6 N '15; Same cond. Am Gas Light J 103:274 N '15; Same cond. Am Gas Light J 103:274
N 1 '15
Arc-light controller for motion picture projection apparatus. il Sci Am 112:272 Mr 20
'15
Arc Pith

rc with unconsumed electrodes; abstract. W. A. Darrah. il Elec W 66:1099-1100 N 13

'15
Chemistry of flaming arc carbons. W: C.
Moore. Met & Chem Eng 13:52-5 Ja '15;
Same. Sci Am S 79:122-3 F 20 '15; Abstract,
with discussion. Elec R & W Elec'n 66:8234 My 1 '15
Compensarc for motion-picture projectors
C. Walford. diag Elec R & W Elec'n 67:230-1
Ag 7 '15

Conditions determining the candle-power and steadiness of large current arcs for search lights. H. Ayrton. Illum Engr 8:78-81 F '15

Current supply for motion picture machines. H. R. Johnson, il diags Gen Elec R 18:895-904 S '15

Development of the flame carbon. R. B las, jr. Illum Eng Soc 9:710-15 no 8'14

Electric arc in vapors and gases at reduced pressures. W. A. Darrah, il diags Met & Chem Eng 13:915-18 D 1 '15

Flame-arc lighting of Indianapolis streets. il Elec W 66:452-3 Ag 28 '15

Installation of luminous arc lamps in Worcester, il Elec R & W Elec'n 66:25-8 Ja 2 '15

Integrating sphere and arc lamp photometry; with discussion. N. K. Chaney and E. L. Clark. Illum Eng Soc 10:1-37 no 1 '15 Luminous arc lamp. R. B. Hussey and S. C. Rogers, il diags Elec R & W Elec'n 67:399-404 S 4 '15

Modern arc lamps, C. E. Stephens, il Elec R & W Elec'n 67:409-12 S 4 '15 diags

Paint and dye testing; use of the white flame arc as a standard. W: R. Mott. Sci Am S 80: 350-2 N 27 '15

Present status of arc-lamp carbons. V. A. Clarke. il Elec R & W Elec'n 67:406-8 S 4

Rotary brush for washing arc-lamp inner globes, plan Elec W 66:597 S 11 '15

Electric lamps, Arc -- Continued

Status of are lamp as street illuminant. Elec W 65;1070 Ap 24 '15 Street lighting with modern are lamps. W. P. Hurley. Illum Eng Soc 10:405-6 no 5 '15 See also Electric lamps, Mercury vapor

Electric lamps, Incandescent Another Edison anniversary, il Power 42:565-6 O 19 '15

Edison and the invention of the electric incandescent lamp, il Elec R & W Elec'n 67: 676-8 O 9 '15; Same abr. Foundry 43:404 O

Electric incandescent lamps. Illum Engr 7:513-

Electric incandescent lamps. Illum Engr 7:513-14, 547-8 N-D '14

Electric incandescent lamps; committee report. Illum Eng Soc 10:520-5 no 7 '15; Same. Illum Engr 8:411-14 O '15; Same cond. Am Gas Light J 103:273-4 N 1 '15

Electric light—a factor in civilization. S. E. Doane. W Soc E J 20:1-14; Discussion. 20: 14-26 Ja '15

Doane. W Soc E J 20:1-14; Discussion. 20: 14-26 Ja '15
Filament size and intensity of projected beam.
L. C. Porter, Elec W 66:177 Jl 24 '15
Incandescent headlights and projectors. P. S. Bailey. ii Illum Eng Soc 10:271-80 no 3 '15
New outdoor incandescent lighting unit. diags
Elec R & W Elec'n 67:167 Jl 24 '15
Practical rating of electric incandescent lamps; with discussion. F. W. Willcox. diags
Illum Engr 8:163-85 Ap '15; Excerpt. Elec W 65:990-1 Ap 17 '15
Rating and designation of electric incandescent lamps; abstract of paper and discussion.
E. Solomon. Elec W 65:1465; 66:19, 75, 137 Je 5, Jl 3-17 '15
Rating of incandescent lamps in Germany. Elec W 66:598 S 11 '15
Thirty-five years of lamp sales. Elec W 66:860-1 O 16 '15; Abstract. Illum Engr 8:456-7 N '15
Visit to some of the leading electric lamp factories near London. il Illum Engr 7:527-38 factories near London, il Illum Engr 7:527

Year's progress in methods of making and selling incandescent electric lamps, E. J. Edwards and R. E. Scott. Elec R & W Elec'n 66:16-18 Ja 2 '15

See also Audion; Electric lamps, Tung-sten; Electric lighting, Incandescent; Safety

Testing

Rack and switchboard for life tests on series incandescent lamp. il diag Elec W 65:40 Ja 2

Electric lamps, Mercury vapor Improved quartz mercury-vapor lamp for bio-investigations and photochemical investigations. logical and photochemical investigations. W. T. Bovie, il diag Am Chem Soc J 37: 1721-6 Jl '15

logical and photochemical investigations. W. T. Bovie, il diag Am Chem Soc J 37: 1721-6 JI '15
Industrial lighting by mercury vapour lamps, il Illum Engr 8:344-5 Ag '15
M-shaped tubular lamp for photographic enlarging, il Elec W 66:423 Ag 21 '15; Elec R & W Elec'n 67:492 S 11 '15
Shop illumination by quartz lamps, il Ry Age (Mech ed) 88:650 D '14
Sterilization of water by ultra-violet rays of the mercury-vapor quartz lamp, M. von Recklinghausen, diags Am Inst E E Pro 33:1049-62 Je '14; Same cond. Eng M 47:756-8 Ag '14; Discussion, Am Inst E E Pro 33: 1996-12 D '14

Temperature of the mercury arc. J. C. McLennan. Sci Am S 79:107 F 13 '15

Electric lamps, Pocket Improved batt: marketed lamps, il Elec W 66:715 S 25 '15

Pocket lamps. Elec W 66:541 S 4 '15

Electric lamps, Tungsten
Application of the new high-efficiency tungsten lamp to photography; with discussion,
M. Luckiesh. il Illum Eng Soc 10:149-80 no

Card system for obtaining life records of gas-filled lamps. Elec W 65:1240 My 15 '15

Changes in details of gas-filled lamps. Elec W 65:1110 My 1 '15

Characteristic equations of tungsten filament lamps and their application in heterochro-matic photometry. G. W. Middlekauff and J. F. Skogland. U S Bur Stand Bul 11:483-534

My 27 '15; Abstract. J Fr Inst 179:97-9 Ja '15; Excerpt. Illum Eng Soc 9:734-68; Discussion. 9:769-74 no 8 '14
Characteristics of gas-filled lamps; with discussion. G. M. J. Mackay. Illum Eng Soc 9: 775-94 no 8 '14
Compensation for mazda C lamps. H. D. Brown. diag Gen Elec R 18:596 Je '15
Direct-reading device for use in computing characteristics of vacuum tungsten lamps (with computing chart). J. F. Skogland. U S Bur Stand Bul 12:269-88 N 8 '15; Abstract. J Fr Inst 180:102-4 Jl '15
Experience with gas-filled lamps at Brooklyn. il Elec W 66:210 Jl 24 '15
Experience with mazda gas-filled street lamps. C. H. Shaw. Elec R & W Elec'n 66:416 Mr 6 '15
Gas-filled lamp in photography. Elec W 65:

Gas-filled

lamp in photography. Elec W 65: Iy 8 '15

Gas-filled lamp in photography. Elec w os. 1154-5 My 8 '15
Gas-filled lamp studies at Boston Tech. Elec W 65:1574 Je 12 '15
Gas-filled lamps. G: Cotton; E. J. Edwards. Elec W 65:1100-1 My 1 '15
Gas-filled lamps showing remarkable longevity at lubuque. la. il Elec W 65:1709-10 Je 26 '15
Gas-filled ornamental lighting at Rockville Center, N. Y. A. L. Powell. il Elec W 66: 483 Ag 28 '15
High candle-power mazda lamps for steel 18:

483 Ag 28 '15 High candle-power mazda lamps for steel mill lighting. G. H. Stickney. il Gen Elec R 18: 377-83 My '15

377-83 My '15
Incandescent lamps for projectors. L. C. Porter, il Gen Elec R 18:371-6 My '15
Lighting of ships. L. C. Porter, il Gen Elec R 18:143-6 F '15; Same. Int Marine Eng 20: 336-8 Ag '15
Mazda C lamps and illumination progress.
H. H. Magdsick, Elec R & W Elec'n 67: 397-8 S 4 '15

397-8 S 4 '15
Mazda-lamp fixtures for street-lighting service.
il Flec R & W Elec'n 65:1191-2 D 19 '14
Melting point of tungsten; abstract. I. Langmuir. Elec W 66:464 Ag 28 '15
Modern street lighting with mazda lamps.
H. A. Tinson. il Gen Elec R 18:659-65 Jl '15
New developments in the projection of light.
L. C. Porter. il Illum Eng Soc 10:38-54 no 1
'15
New hundred matter.

L. C. Porter, il Illum Eng Soc 10:38-54 no 1 '15

New hundred-watt gas-filled mazda lamp, il Elec R & W Elec'n 66:313 F 13 '15

Nitrogen-filled lamps in Chicago. il Elec W 65:1173-4 My 8 '15

Nitrogen-filled tungsten lamp for photographic purposes; abstract. W. Voege. Elec W 65: 1116-17 My 1 '15

Nitrogen-filled tungsten lamps. Elec W 66: 708-9 S 25 '15

Operation of mazda C street lamps. C. H. Shaw. Elec R & W Elec'n 67:297 Ag 14 '15

Opportunities of illumination with gas-filled lamps. il Elec W 64:1157 D 12 '14

Overheating of 200-watt nitrogen-filled lamp. E. J. Edwards. Elec W 65:344 Ap 3 '15

Overshooting in tungsten lamps. A. G. Worthing. J Fr Inst 180:478-9 O '15

Phenomena of the nitrogen-filled lamp. diag Elec W 64:111-12 D 5 '14

Photometry of gas-filled incandescent lamps:

Elec W 64:1111-12 D 5 '14
Photometry of gas-filled incandescent lamps; with discussion. C. H. Sharp. il Illum Eng Soc 9:1021-32 no 9 '14
Photometry of gas-filled lamps. D. H. Tuck. diags Elec W 65:78 Ja 9 '15
Photometry of the gas-filled lamp. G. W. Middlekauff and J. F. Skogland. Elec W 64:1248-51 D 26 '14
Present practise in the use of typerates.

Present practise in the use of tungsten filament lamps for the lighting of metal working plants; with discussion. A. L. Powell and R. E. Harrington. il Illum Eng Soc 9:814-38

no 8 '14 Saving of \$400,000 effected in New York city by substituting incandescent lamps for arc lamps. il Elec W 66:512-13 S 4 '15 Securing business with the nitrogen lamp. W. A. Wadsworth. Elec R & W Elec'n 66: 194-5 Ja 30 '15 Securing increased load with nitrogen lamps at Cincinnati. Elec W 65:428 F 13 '15 Series transformer for gas-filled tungsten street lamps. il Elec R & W Elec'n 66:38 Ja 2 '15

Simulating old illuminants. M. Luckiesh. Elec R & W Elec'n 67:161-3 Jl 24 '15

Electric lamps, Tungsten—Continued
Temperature and blackening effects in helical
tungsten filaments. E: E. Shackelford. J Fr
Inst 180:619-21 N '15

See also Automobiles-Lighting

#### Control

Dimmers for tungsten lamps, A. E. Waller, il Am Inst E E Pro 34:221-8 F '15; Same cond. Power 41:491 Ap 6 '15; Discussion, Am Inst E E Pro 34:2590-4 O '15 Lamp-socket energy economizer, il Elec R & W Elec'n 66:742-3 Ap 17 '15

# Testing

Competitive economy test of tungsten-filament lamps. H. H. Higbie. Elec R & W Elec'n 66:1201-7 Je 26 '15
Integrating sphere equipped for testing gas-filed lamps. il diag Elec W 65:120 Ja 9 '15
Life-testing equipment for tungsten lamps; electrical features of the incandescent lamptesting laboratory at Nela Park, Cleveland, il plan Elec W 66:12-16 Jl 3 '15

Electric lanterns

Electricity replacing oil in railroad hand lan-terns, il Sci Am 113:472 N 27 '15 Redsealite portable electric lantern, il Elec R & W Elec'n 65:1229 D 26 '14

Electric light. See Electric lighting

Electric light and power association, Northwest. See Northwest electric light and power association

Electric light association, Indiana. See Indiana electric light association

Electric light association, National. See National electric light association

Electric light carbons

Chemistry of flaming arc carbons. W: C. Moore. Met & Chem Eng 13:52-5 Ja '15; Same. Sci Am S 79:122-3 F 20 '15; Abstract, with discussion. Elec R & W Elec'n 66:823-4 My 1 '15

My 1 '15

Electric light fixtures
Art and science in home lighting; with discussion. G: W. Cassidy. il Illum Eng Soc 10:55-81 no 1 '15; Abstract. Elec W 65:484-6 F 20 '15

Edwards lighting fixtures. il Elec I: & W Elec'n 67:862-3 N 6 '15

Lighting the Equitable building. F. L. Godinez. il Arch & Bldg 47:188-90 My '15

New receptacles for semi-indirect and similar fixtures. il Elec R & W Elec'n 67:384 Ag 28 '15

Out-door light clusters. il Elec Ry J 46:112 Jl

17 '15 Points to remember when selecting fixtures for gas-filled tungsten lamps. Elec W 66: 409 Ag 21 '15 Self-contained unit for indirect and semi-indirect lighting. il Elec W 66:1218 N 27 '15 Two new illumination fixtures, il diag Ry Age 59:867 N 5 '15

See also Street lighting fixtures

Electric light plants, Municipal. See Electric plants, Municipal

plants, Municipal

Electric lighting

Adjustable chart to show how seasons affect lighting bills. Elec W 66:47 Ag 28 '15

Artificial lighting of moving picture studios. W: A. D. Evans. il Illum Engr 8:284-8 Je '15

Car electric lighting systems. E. S. McNab. Ry Age (Mech ed) 89:467-8 S '15

Characteristics of the three-wire generator: analysis of its behavior when used as a balancer in a direct-current lighting system.

O. J. Ferguson. diags Elec W 64:1199-1204 D 19 '14

Combining the esthetic and the utilitarion in

19 '14 Combining the esthetic and the utilitarian in illumination. il Elec W 66:740-1 O 2 '15 Converting night into day; what the inventor has done for oil, gas, and electricity in illumination. il Sci Am 112:536+ Je 5 '15 Detroit's municipal lighting plant. T: Wilson. il plan Power 40:832-5 D 15 '14 P Sevelemments in illumination during 1914 P S.

Developments in illumination during 1914. P. S. Millar. Elec W 65:22-4 Ja 2 '15

Effect of change of lamp voltages on vision; abstract. W: Kunerth. Elec W 66:541-2 S 4 '15

Effective illumination of streets. P. S. Millar. diags 11 pls Am Inst E E Pro 34:1379-98 Ji '15; Abstract. Elec W 66:62-4 Jl 10 '15; Discussion. Am Inst E E Pro 34:3053-62 D '15 Elaborate temporary wiring installation; provisions for electric illumination of the outdoor performance of Siegfried given in the Harvard stadium at Cambridge, Mass. il Elec W 66:474-5 Ag 28 '15 Electric light—a factor in civilization. S. E. Doane. W Soc E J 20:1-14; Discussion. 20: 14-26 Ja '15 Electric lighting data: station equipment—amount of current used for street lighting and other purposes—fuel statistics—number and kind of lamps used for street lighting—ornamental lighting—rates. Munic J 38:884-94 Je 24 '15 Electric lighting for motion-picture studios.

94 Je 24 15 Electric lighting for motion-picture studios. L. G. H. Smith. Elec W 65:1040-2 Ap 24 '15 Electric lighting of "court" and "clock" golf courses. M. E. Trimble. il diags Elec W 66: 308 Ag 7 '15

courses. M. E. Trimble, il diags Elec W 66: 308 Ag 7 '15
Electric lighting of railway passenger cars.
E. S. M. Macnab. Ry R 57:696-9 N 27 '15
Electric sunshine in movie production in California, ii Elec W 66:136 Jl 17 '15
Electrical equipment of Panama-Pacific exposition, il diags plan Elec W 64:1241-7 D 26 '14
Electrical features of Boston custom house tower, il Elec R & W Elec'n 67:336-7 Ag 21

Heating of screw-socket lamp holders; ab stract. C. C. Paterson. diag Elec W 65:532 I 27 '15

27 '15
Illuminating engineering society; review of the Washington convention. J. R. Cravath. Elec W 65:738-9 O 2 '15
Illumination features of Montreal station. il Elec W 65:334-5 F 6 '15
Illumination of the suburban house; the use of electricity or acetylene. H. L. Alt. il diags Brickb 24:248-51 O '15
Indiana electric light association 7th annual convention. Elec R & W Elec'n 67:534-6 S 18 '15

indiana electric light association 7th annual convention. Elec R & W Elec'n 67:534-6 S 18 '15 Indiana electric light association's seventh annual convention. Elec W 66:626-7 S 18 '15 Individual electric lighting plants for steam shovels. il Elec R & W Elec'n 66:90-1 Ja 9 '15; Iron Age 94:1396 D 17 '14; Eng & Min J 99:15 Ja 2 '15; Colliery 35:397-8 F '15 Interior wiring for lighting and power service. A. L. Cook. diags Power 41:601-5, 640-3, 666-71 My 4-18 '15 Kansas City Union station lighting. il Elec W 65:1253-5 My 15 '15 Lighting at San Diego exposition. il Elec W 65:805-7 Mr 27 '15 Lighting plant for tracklaying, Priesha Upingten Kalkfontein Ry. N. K. Prettejohn. il Ry R 57:515-16 O 23 '15 Lighting the pageant of Lexington. L. C. Porter. il plan Elec W 65:811-13 Mr 27 '15 Master-switch lighting circuits. V. N. Heath. diags Elec W 65:811-13 Mr 27 '15 N. E. L. A. convention. San Francisco, June 8-11. Elec Ry J 45:1106-9 Je 12 '15 N. E. L. A. Lowa section, 15th annual convention. Keokuk, April 20-22. Elec R & W Elec'n 66:816-20 My 1 '15 N. E. L. A. Michigan section, 4th annual convention. Elec R & W Elec'n 67:27-30 Jl 3 '15 N. E. L. A. Shichigan section, 4th annual convention. Elec R & W Elec'n 66:816-7 Ja 23 '15; Same. Elec R & W Elec'n 66:245 F 6 '15 N. E. L. A. 38th convention; abstracts of papers and reports. Elec R & W Elec'n 66:1107-13 Je 12 '15 N. E. L. A. 38th convention; abstracts of papers and reports. Elec R & W Elec'n 66:1107-13 Je 12 '15 New step in street illumination. I. Ladoff. plan Elec R & W Elec'n 67:196-200 Jl 31 '15 Ohio electric light association 21st annual convention. Elec R & W Elec'n 67:196-200 Jl 31 '15 Review of the electric lighting industry. C. W. Stone. Gen Elec R 18:439-43 Je '15

Review of the electric lighting industry. C. W. Stone. Gen Elec R 18:439-43 Je '15 Small lighting plants. il Elec W 65:359 F 6 '15

Year in the electrical industry. Elec R & W Elec'n 66:9-10 Ja 2 '15

See also Electric arc; Electric distribu-tion; Electric lamps; Electric light carbons; Electric light fixtures; Electric meters; Electric signs; Electric wire and wiring; Locomotive headlights; Photometry; Search-

# Electric lighting -Continued

#### Cost

Cost

Comparative costs of gas and electricity for illuminating purposes. B. K. Cash. Am Gas Light J 102:167+ Mr 15 '15

Cost of electric service for a town of 750. J. D. Bowles. Elec W 66:254 Jl 31 '15

Gas and electric street lights; comparison of cost and efficiency. il Munic Eng 49:96-8 S '15

Report of committee on piping large buildings for gas; economical comparison of gas and electric lighting operating indoors. Am Gas Inst Pro 9:pt 2, 1431-9 '14

Your lighting bill for 1925. A. W. Deininger, Sci Am S 80:187 S 18 '15

Art of rate-making. A. Dow. Elec W 65:17-18

Ja 2 '15 Central-station rate making. P. L. Kiefer. Power 42:268-70 Ag 24 '15 Charging for energy; abstract. Bueggeln. Elec W 65:859 Ap 3 '15 Cincinnati franchise negotiations. Elec W 66: 105 Jl 10 '15

105 J1 10 '15 Comparison of electric light and power rates. J. C. Dickerman. Power 42:8-15 J1 6 '15 Decision by Oregon commission, with table of costs for different classes of consumers of the Hood River gas and electric company. Elec W 66:431 Ag 21 '15 Houston, Texas, has co-operative lighting fran-chise. P. H. Sheldon. Munic Eng 48:41-3 Ja

Municipal electric light plants: rates. Munic Eng 48:111-12 F '15 New York Edison company; opinion and order of the first district commission. Elec R & W Elec'n 67:802-4 O 30 '15

New York rate reduction accepted. Elec W 65: 828 Mr 27 '15 Northwest light and water company; decision of commission. Elec R & W Elec'n 67:976-

7 N 27 '15
Rates and rate making. P. M. Lincoln. diags
Am Inst E E Pro 34:2175-2214 O '15; Abstract. Elec R & W Elec'n 67:722-3 O 16 '15
Rates for light and power; tabulation. Munic
J 38:893 Je 24 '15
Simple rate system. Elec R & W Elec'n 67:
978 N 27 '15

Westchester lighting company cases. Elec R & W Elec'n 66:35-6 Ja 2 '15

# Electric lighting, Arc

See also Electric arc; Electric lamps, Arc; Electric light carbons

Electric lighting, Decorative
Artificial illumination, architecture and decoration. Elec W 66:484 Ag 28 15
Details of Woolworth tower lighting, il Elec
R & W Elec'n 66:1048-9 Je 5 15

Flood lighting of building fronts from orna-mental cluster posts, il Elec R & W Elec'n 67:724-5 O 16 '15

Flood lighting versus outline lighting, il Elec W 66:369 Ag 14 '15

Illumination at the Panama-Pacific exposition. il Elec W 65:1383-6 My 29 '15

Panama-Pacific international exposition at night; how the illuminating engineer uses light decoratively. H. M. Wright, il Sci Am 112:378+ Ap 24 '15

See also San Francisco-Panama-Pacific international exposition-Lighting

Electric lighting, Incandescent
Carborundum shunt for series incandescent
lamps; abstract. H. Lux. Elec W 65:603 Mr

New York's greatest lighting spectacle: Woolworth tower. C: W. Person. il Sci Am 112:171 F 20 '15

Nitrogen-filled lamps in Boston art museum. il Elec W 66:481-2 Ag 28 '15

Street lighting practice with incandescent lamps. G. H. Stickney, il Munic Eng 48:80-8 F '15

Your lighting bill for 101. A. W. Deininger, Sci Am S 80:187 S 18 '15

See also Electric lamps, Incandescent; Electric lamps, Tungsten

Electric lines

lectric lines
Combined telephone and telegraph circuit for operating water-power system, diag Elec W 64:1258 D 26 '14
Concrete transmission-line poles, R. D. Coombs, il Elec W 65:341-3 F 6 '15
Equipment for single-circuit transmission-line poles, il Elec W 66:714 S 25 '15
Four years' operating experience on a high tension transmission line. A. Bang, diags pls Am Inst E E Pro 34:1425-45 JI '15; Abstract, Elec W 66:10-11 JI 3 '15;
High-voltage transmission at high altitude, P. H. Thomas, il diags plan Elec W 65:29-34, 87:99; Ja 2-9 '15

P. H. Thomas, il diags plan Elec W 65:29-34, 87-92 Ja 2-9 '15 Hydroelectric development on Bishop Creek, Cal. C. O. Poole, il Elec W 64:1144-7 D 12

Long transmission lines: comparison of the Keokuk-St. Louis and the Big Creek-Los Angeles systems. R. A. Philip. diag Elec W 64:1147-8 D 12 '14

Angeles systems. A. A. Philip. diag Elec W 64:1147-8 D 12 '14
N. E. L. A. committee report on underground construction, diag Elec W 65:1519-20 Je 12 '15; Elec R & W Elec'n 66:1112-13 Je 12 '15
New Carquinez Straits high-tension crossing, il Eng N 74:248-9 Ag 5 '15
New method of making service connections. Elec R & W Elec'n 67:275 Ag 14 '15
Pennsylvania overhead line crossing specifications. Elec Ry J 46:186 Jl 31 '15
Receiving-end impedance of a conducting line loaded at both ends. A. E. Kennelly. Elec W 66:182-4 Jl 24 '15
Reinforcing metal poles. G. H. M'Kelway. Elec Ry J 46:365-7 Ag 28 '15
Report of the Engineering association committee on power distribution. Elec Ry J 46: 748-9 O 9 '15
Sag in overhead conductors. K. L. Wilkinson.

748-9 O 9 '15
Sag in overhead conductors, K, L. Wilkinson,
Elec W 65:336-7 F 6 '15
Sag-tension calculations. H. Pender, Elec W
66:34-5 Ag 14 '15
Special structures for electric lines; how the
necessity of transposing circuits, supporting
switches and transformers and crossing obstructions is met R. D. Coombs, il Elec W

switches and transformers and crossing obstructions is met. R. D. Coombs. il Elec W 65:980-1 Ap 17 '15
Steel-reinforced aluminum cables. E. T. Driver and E. V. Pannell. Elec W 66:524-6 S 4 '15
Steel-tower, transmission-line construction.
A. B. Cudebec. il Elec W 66:127-33 JI 17 '15
Tower foundations for the Cristobal-Balboa transmission line. I. W. Dye, il diags Eng Soc W Pa 30:973-90 Ja '15; Same. Ry R 56: 728-31 My 29 '15: Same cond. Eng & Contr 44:317-20 O 20 '15
Transmission-line construction for mountain districts. H. M. Somerville. il diag Elec W 66:862-3 O 16 '15
Underground cable on the Pennsylvania railroad. I. C. Forshee. il Ry Age 59:269-71 Ag 13 '15

Underground wires on the Panama railroad.
il Ry Age 58:451-3 Mr 12 '15
Use of copper-clad and iron wire on lines
serving small loads. Elec W 66:469 Ag 28 '15
Ways of handling outgoing lines from a generating station. il Elec W 66:754 O 2 '15

See also Electric cables; Electric conduits; Electric fuses; Electric railroads; Electric service, Rural; Electric transmission; Elec-tric wire and wiring; Telegraph; Telephone lines

#### Cost

Cost data on 6600-volt lines. Elec W 66:16 Jl

3 '15 Cost of constructing a short transmission line. Elec W 65:1244 My 15 '15 Cost of 66,000-volt transmission line. Elec W 65:904 Ap 10 '15 Cost of transmission lines in New England. Elec W 66:135 Jl 17 '15 Costs of extensions. Elec W 65:1191 My 8 '15

# Inductive interference

Discussion on irregular wave shapes, (See Proceedings for June, 1915) Am Inst E E Pro 34:3087-3116 D '15
Report by the Joint committee on inductive interference; discussion. Am Inst E E Pro

interference; discussion. Am Inst E E Pro 34:313-35 F '15 Telegraph and telephone troubles. Engineer 119:234 Mr 5 '15

## Electric lines - Continued

# Maintenance and repair

Maintenance and repair

Climbers for structural-steel poles, il diag

Elec Ry J 46:1049 N 20 '15

Replacing insulators upon live lines, il Elec
R & W Elec'n 67:339 Ag 21 '15

Speedy and inexpensive pole moving in San
Francisco, S. L. Foster, il Elec Ry J 46:
874 O 23 '15

Ways of hunting trouble on distribution systems, il diag Elec W 66:579-82, 638-42 S 1118 '15

# Protection

Overhead straight line and angle protective crossing clamps, diags Elec Ry J 46:598-9 S 18 '15; Elec W 66:770 O 2 '15
Protection of high-voltage lines against birds; abstract, R. von Erhardt, Elec W 66:652 S

Protective coatings for line structure and equipment, R. D. Coombs, Elec W 65:730 Mr

See also Electric protective apparatus

# Electric locomotives

See diso Electric protective apparatus
Electric locomotives
Battery locomotives for track laying, il Engineer 119:585-6 Je 11 '15
Chicago, Milwaukee & St. Paul locomotives.
A. H. Armstrong, il diag Gen Elec R 18: 600-3 Jl '15; Same, Elec Ry J 45:1072-4 Je 5 '15; Same, Engineer 120:153 Ag 13 '15
Crank drive in electric locomotives. J. Buchli, Engineer 120:287-9 S 24 '15
Delivery of electric locomotives for the Chicago, Milwaukee & St. Paul, il diag Ry R 57:451-2 O 9 '15
Double truck electric locomotive, il Eng & Contr 43:185-6 F 24 '15
Electric locomotive; comparisons with steam locomotive as to selection and rating. A. H. Armstrong, il diag Am Soc M E J 37:384-8 Jl '15; Same abr, Sci Am S 80:342-3 N 27 '15
Electric locomotive design, W: Arthur, Elec Ry J 45:1209 Je 26 '15
Electric towing at Panama, il diag Elec Ry J 45:235-7 Ja 30 '15
Electric traction on the Norfolk & Western railway, il diag plans Eng N 73:1192-5 Je 177 '15
Electricity in the construction and operation

17 '15 lectricity in the construction and operation of the Panama canal. E: Schildhauer. il diags Gen Elec R 18:sup729-47 Jl '15 Exhibition of St. Paul locomotives il Elec Ry J 46:1036-7 N 20 '15 First 3000-volt locomotive for the Chicago, Milwaukee & St. Paul railway company. E. S. Johnson. il Gen Elec R 18:1154-8 D '15 Gas-electric locomotives for the Dan Patch electric lines. il diag Ry R 57:423-6 O 2 '15; Elec Ry J 46:668-70 O 2 '15; Elec R & W Elec'n 67:860-1 N 6 '15; Ry Age 59:658-60 O 8 '15; Eng N 74:782 O 21 '15 Gasoline-electric locomotives. il Power 42:660 N 9 '15

N 9 '15
Locomotive and trail cars in Detroit United freight service. C. L. Keller. it Elee Ry J 45:848-9 My 1 '15
Mechanical features and performance of electric locomotives. A. H. Armstrong and A. F. Batchelder. Ry Age 59:247 Ag 6 '15
Mechanical problem of the electric locomotive. G. M. Eaton. Ry Age 59:604-5 O 1 '15; Abstract. Elee Ry J 46:626 S 25 '15
Mercury vapor rectifier locomotive an accomplished fact. il diag Elec Ry J 44:1343 D 19 '14; Same. Engineer 119:142-3 F 5 '15
Modern electric mine locomotive. G. Bright.

Modern electric mine locomotive. G. Bright, il Am Inst E E Pro 34:1615-20 Ag '15; Same. Colliery 36:145-6 O '15

Norfolk & Western electrification, plans (supp) Elec Ry J 45:1060-3 Je 5 '15

Pennsylvania locomotive on turntable at Pan-ama-Pacific exposition. il Elec Ry J 45:387 F 20 '15

Storage-battery locomotives. Colliery 35:259-60 D '14

Storage-battery locomotives. Eng & Min J 99: 533 Mr 20 '15

Three-phase Italian passenger locomotives. G. Pontecorvo, il diags Elec Ry J 45:283-5 G. Pon F 6 '15

Three thousand-volt direct-current electric locomotives for the Chicago, Milwaukee & St. Paul railway. Sci Am 113:391+ N 6 '15 Towing locomotives for the Panama canal. C. W. Larson. il diags Gen Elec R 18:101-17 F '15; Same cond. Eng N 73:145-7 Ja 28 '15; Ry Age 58:189-91 Ja 29 '15; Elec R & W Elec'n 66:187-91, 233-7 Ja 30-F 6 '15; Elec W 65:288-90 Ja 30 '15; Eng Rec 71:134-6 Ja 30 '15; Ry R 56:150-3 Ja 30 '15; Sci Am S 79:72-4 Ja 30 '15; Eng M 48:744-8 F '15; Int Marine Eng 20:161-2 Ap '15; Engineer 119: 323-5 Ap 2 '15

Marine Eng 20,101-2 Ap 10, Engineer 110, 323-5 Ap 2 '15 Underground haulage by storage-battery locomotives in the Bunker Hill & Sullivan mine. J. W. Gwinn. il Am Inst Min E Bul 98:239-47 F '15; Discussion. 101:1189-97 My '15

See also Railroads-Electrification

#### Performance

Data on four years' performance, electric locomotives of the Pennsylvania R. R. il Ry R 57: 53-4 Jl 10 '15; Same cond. Ry Age 59:513 S 17 '15

Performance of Pennsylvania railroad's electric locomotives at New York terminal, Elec R & W Elec'n 66:1214 Je 26 '15

#### Repair

Electric locomotive repair shops, New York, New Haven & Hartford R. R., Van Nest, New York, diag plans Ry R 57:363-5 S 18'15

#### Electric machinery

Air cleaning apparatus for the ventilation of generators and transformers. W: Baum. il diags Gen Elec R 18:801-12 Ag '15 Automatic electrical tools. il Mach 22:245-6

British standardization rules. Elec W 65:1245 My 15 '15

Classification of electromagnetic machines. G. Fox. Power 41:298-9 Mr 2 '15 Classification of electromagnetic machinery. F. Creedy. diags Am Inst E E Pro 34:1399-1423

Cost per pound of electrical machinery. L. A. Doggett. Elec W 66:746-8 O 2 '15 Machine which heats and drives rivets. il Iron Age 95:937-8 Ap 29 '15 Maintaining high insulation resistance. H. M. McLellan. diag Power 41:365 Mr 16 '15

Physical limitations in d-c. commutating machinery. B. G. Lamme, Am Inst E E Pro 34:1559-1614 Ag '15

Practical experience in the operation of electrical machinery. E. C. Parham. diags Gen Elec R 17:999-12, 961-3, 1193-6; 18:56-9, 146-7, 217-18, 304-7, 401-4, 666-8, 861-2, 928-9, 1003-5, 1082-3, 1146-8 S-O, D '14-My, JI-D '15

Reluctance of some irregular magnetic fields.

J: F. H. Douglas, diags Am Inst E E Pro
34:887-925 My '15; Discussion, 34:3078-86 D

Shape of the pressure wave in electrical machinery. S. P. Smith and R. S. H. Boulding. diags Inst E E J 53:255-38; Discussion. 53: 238-47, 323-5 F 1-15 '15

Special electric butt-welding machines. D. T. Hamilton, il diags Mach 21:735-9 My '15

Troubles encountered in the operation of carbon brushes in direct-current generators and motors. E. H. Martindale. il Am Inst E E Pro 34:373-84 Mr '15; Same cond. Power 41:558-9 Ap 20 '15; Same cond. Engineer 119:468-9 My 7 '15; Same cond. Causes of poor commutation and remedies) Elec W 65:863-4 Ap 3 '15; Discussion. Am Inst E E Pro 34:2966-74 D '15

Year in the electrical industry. Elec R & W Elec'n 66:10-12 Ja 2'15

See also Brushes (electric machinery); Commutators; Dynamos; Electric apparatus and appliances; Electric controllers; Electric driving; Electric engineering; Electric machines; Electric motors; Electric plants; Electric protective apparatus; Electric shovels; Electric transformers; Electricity in mining; Electricity on the farm; Rotary converters; Ship propulsion, Electric

#### Losses

See also Eddy-currents

# Electric machinery -Continued

#### Manufacture

Castings as electrical apparatus parts. A. B. Reynders. Iron Age 94:1496-7 D 31 '14; Abstract (Holding an electrical manufacturer's business). Foundry 43:96-7 Mr '15 Electricity in the manufacture of electrical machinery. il Elec R. & W Elec'n 66:287-9 F

Testing

Separation of the no-load stray losses in a continuous-current machine by stroboscopic running-down methods. D: Robertson. bibliog diags Inst E E J 53:308-22 F 15 '15

Electric machines

Quickly constructed static machine. il Sci Am 113:164 Ag 21 '15

Electric measurement

Electric measurement
Adjustments of the Thomson bridge in the measurement of very low resistances. F. Wenner and E. Weibel. U S Bur Stand Bul 11:65-8 N 15 '14
Calculation of strength of electric currents when measured by Rayleigh current balance. Elec R & W Elec'n 67:404 S 4 '15
Calculation of the maximum force between two parallel, coaxial, circular currents. F: W. Grover. J Fr Inst 179:714-16 Je '15
Calibration of current transformers by means of mutual inductance. C: Fortescue, diags pls Am Inst E E Pro 34:1199-1215 Je '15
Cathode ray tube and its application. M. E. Tressler. diag Gen Elec R 18:816-20 Ag '15
Comparison of calculated and measured corona loss curves. F. W. Peek, jr. Am Inst E E Pro 34:169-76 F '15; Discussion, 34:2620-1 N '15 Pro 8

Pro 34:169-76 F '15; Discussion. 34:2620-1 N '15
N '15
Determining the load in branch distribution circuits of direct-current systems; abstract.
L. Lewin. Elec W 65:165-6 Ja 16 '15
Differential method for the determination of losses in coils. A. Hund. diags Elec W 65: 1300-1 My 22 '15
Direct-reading instrument for measuring the logarithmic decrement and wave length of electromagnetic waves. F: A. Kolster, il diags U S Bur Stand Bul 11:421-55 My 10 '15
Edward Weston's inventions. L. H. Baekeland. por Sci Am S 79:109 F 13 '15
Electrical constants of antennas. L: Cohen. diag Elec W 65:286-8 Ja 30 '15
Investigation of dielectric losses with the cathode ray tube. J: P. Minton. il Am Inst E E Pro 34:1115-65 Je '15
Leakage prevention by shielding, especially in potentiometer systems. W. P. White. diags Am Chem Soc J 36:2011-20 O '14
Measuring one-millionth of an ohm; abstract. E. H. Rayner. Elec W 66:763 O 2 '15
Measuring the current in d. c. circuits. O: A. Knopp. il diags Elec W 66:751-2 O 2 '15
Methods, data, and new apparatus for measuring electrical conductivity above 1500° C. of vapors at normal pressure. E. F. Northrup. il J Fr Inst 179:337-52 Mr '15
Methods of measuring the inductances of low-resistance standards. E. Wenner. E. Weibel.

Methods of measuring the inductances of low-resistance standards. F. Wenner, E. Weibel and F. B. Silsbee, diags U S Bur Stand Bul 12:11-21 O 28 '15

Phase angle of current transformers. C. Dawes. Am Inst E E Pro 34:927-40 My '15

Separation of the no-load stray losses in a continuous-current machine by stroboscopic running-down methods. D: Robertson. bibliog diags Inst E E J 53:308-22 F 15 '15

Sphere gap as a means of measuring high voltage. F. W. Peek, jr. Am Inst E E Pro 33: 889-914 Je '14; Discussion. 34:103-24 Ja '15

Sphere gap discharge voltages at high frequencies, J. C. Clark and H. J. Ryan, il Am Inst E E Pro 33:937-41 Je '14; Discussion. 34:103-24 Ja '15

Ten-to-one ratio for comparing precision resistance standards. C. A. Hoxie. il Gen Elec R 18:915-19 S '15

Transmission line calculator, R. W. Adams, diags Gen Elec R 18:28-30 Ja '15

See also Electric meters; Electric resistance; Electric testing; Electric units; Electrometer; Galvanometers; Magnetic measurements; Voltameters

Electric meters

lectric meters
Alternating-current and direct-current instruments. il Elec W 66:771-2 O 2 '15
Electric vacuum meter; abstract. W. Rohn. il diag Elec W 64:1211 D 19 '14
Electrical measuring instruments. U S Bur Stand Circ 20:1-57 '15
Instrument transformers arranged to serve separate-circuit and totalizing meters. plan Elec W 66:1092 N 13 '15
Measurements for the household. il U S Bur Stand Circ 55:82-90 '15
Meter box to permit reading meter from outside of house. il Elec R & W Elec'n 65:1148-9 D 12 '14

Side of nouse. If Elec I' & W Elec II of 1714

Meter practice on rural electric-service lines.
il Elec W 64:1110 D 5 '14

N. E. L. A. committee report on meters. diag

Elec W 65:1530 Je 12 '15

N. E. L. A. committee report on meters, diag Elec W 65:1530 Je 12 '15

Notes on induction meter design. W. H. Pratt. il Gen Elee R 18:277-81 Ap '15

Power-factor indicator. J: A. Randolph, diags Power 40:836-8 D 15 '14

Prepayment meters in Amsterdam; abstract. W. Lulofs. Elec W 66:1157 N 20 '15

Rates and rate making. P. M. Lincoln. diags Am Inst E E Pro 34:2175-2214 O '15; Abstracts. Elec R & W Elec'n 67:722-3 O 16 '15; Elec W 66:849 O 16 '15

Reactive-factor meters. il Elec R & W Elec'n 65:1152-3 D 12 '14; Same, Elec Ry J 44: 1356 D 19 '14

Standard specification for electricity meters. Engineer 120:279-80 S 17 '15

Variable resistance to motion offered by the registering trains of electric supply meters. S. Evershed. diags Inst E E J 53:498-511 Ap 1 '15; Abstract. Elec W 65:1118-19 My 1 '15

Weston portable electrodynamometer-type ammeters, voltmeters and wattmeters. il Elec R & W Elec'n 67:778 O 23 '15; Met & Chem Eng 18:819 N 1 '15

See also Ammeters; Ampere-hour meters; Electric measurement; Electric testing; Electrometer; Manometers; Ohmmeter; Voltameters; Voltmeters; Watt-hour meters; Wattmeters

# Reading

Camera for reading customers' meters. il Elec W 66:373 Ag 14 '15

# Testina

btaining constant potential for meter testing, il diag Elec W  $66:693~\mathrm{S}~25$  '15 Obtaining

Electric mining. See Electricity in mining

Electric motors

lectric motors
Adjustable-speed single-phase motor, il Elec
W 65:619-20 Mr 6 '15
Advance type single-phase induction motors,
il Elec R & W Elec'n 67:539-40 S 18 '15
Advantages of standard motor speeds, H. N.
Gilbert, Elec R & W Elec'n 67:586 S 25 '15
Alternating- and direct-current motors, A. A.
Fredericks, Power 41:891-2 Je 29 '15
Alternating-current commutator motors; abstract, M. Latour, diags Elec W 66:598 S 11
'15

Characteristics of direct-current motors, H. N. Gilbert, Elec R & W Elec'n 67:325-7 Ag 21

Characteristics of electric motors involved in their application. D. B. Rushmore. Am Inst E E Pro 34:187-93 F '15; Abstract and discussion. Elec W 65:523 F 27 '15; Discussion. Am Inst E E Pro 34:2747-803 N '15 Classification of alternating-current motors. V. A. Fynn. diags Am Inst E E Pro 34:959-1000 My '15 Classification of electromagnetic machinery. F. Creedy. diags Am Inst E E Pro 34:1399-1423 Jl '15 Core loss in series motor. T. M. Robie diags.

1423 Jl '15
Core loss in series motor. T. M. Robie. diags
Power 41:771-2 Je 8 '15
Designing small dynamos and motors. C: F.
Fraasa, fr. diags Sci Am S 80:364-6 D 4 '15
Diehl polyphase squirrel-cage motors. il Elec
R & W Elec'n 67:491 S 11 '15
Direct-current commutating-pole motors. il
Elec W 65:257-8 My 15 '15
Direct-current motors for coal and ore bridges.
R. H. McLain. il Am Inst E E Pro 33:1009-20
Je '14; Discussion. 33:1887-8 D '14
Disconnecting induction motors; abstract. R.
Ruedenberg. Elec W 65:1425 My 29 '15

Electric motors—Continued
Discussion on factors involved in motor application, Am Inst E E Pro 34:2666-746 N 15
Discussion on fields of motor application, Am
Inst E E Pro 34:3006-52 D '15

plication. Am Inst E E Irro :4:2666-746 N 15
Discussion on fields of motor application, Am
Inst E E Pro 34:306-52 D '15
Dumore sewing-machine motor, il Elec R &
W Elec'n 67:633 O 2 '15
Effect of slot design on iron loss. E. B. Millar.
Elec W 66:985-6 O 30 '15
Electric drive for Wilcox & Gibbs sewing
machine. il Elec R & W Elec'n 67:992 N 27
'15; Elec W 66:1220 N 27 '15
Fractional horse power motor application.
H. F. Boe. Am Inst E E Pro 34:3013-18 D '15
Fractional horse power motor load. B. Lester.
il Am Inst E E Pro 34:355-95 Mr '15; Same
cond. Eng M 49:268-71 My '15; Abstract.
Power 41:589-90 Ap 27 '15; Discussion. G. H.
Garcelon. Am Inst E E Pro 34:253-5 N '15
Guarantees on motor and generator overloads.
H. M. Phillips. Power 42:240-1 Ag 17 '15
Hamilton-Beach sewing-machine motor. il
Elec R & W Elec'n 67:773 O 23 '15
How to determine type of motor. F. A. Annett.
diags Power 39:696-8 My 19 '14; Same. Sci
Am S 78:371-5 D 12 '14
Induction motor drive for glass-blowing machines. il Elec W 65:171-2 Ja 16 '15
Induction motors and rules for wiring and
fusing. Elec R & W Elec'n 66:257-8 F 6 '15
Industrial alternating-current motor applications in the metallurgical and chemical industries. H. B. Barnes. Met & Chem Eng
13:297-302 My '15
Installation of motors. M. F. Arloe. diags
Elec R & W Elec'n 67:558-63 S 25 '15
Kimble adjustable-speed single-phase motor.
il Elec R & W Elec'n 66:450-1 Mr 6 '15; Mach
21:592-4 Mr '15
Lamp slip indicator, F: Bedell. Elec R & W
Elec'n 65:1224 D 26 '14
Line disturbance caused by special squirrelcage and wound-rotor motors when starting
elevators and hoists. J. C. Lincoln. diag Am
Inst E E Pro 34:2347-50 N '15
Methods of mounting motors at ceilings. R. G.
Bradshaw. diags Elec R & W Elec'ne 66:73-5

Methods of mounting motors at ceilings. R. G.
Bradshaw. diags Elec R & W Elec'ne 60:73-5

Mine motors, with special reference to electric motors. E. Drennen. Colliery 35:241-5 D

Minneapolis a. c. motor. il Dom Eng 72:351 S

Modern mine haulage motor, C. W. Larson, il Gen Elec R 18:264-8 Ap '15
Motors operated under modified conditions, G. Fox. diags Power 42:472-6 O 5 '15
N. E. L. A. rules to harmonize service requirements for motors, Elec W 66:93 Jl 10 '15
Neutral on interpole machines, E. T. Keenan, Power 42:412-13 S 21 '15
Odd experiences with electrical machinery, O. M. Ward, Power 42:191 Ag 10 '15
Permissible explosion-proof electric motors for mines; conditions and requirements for test and approval. H. H. Clark, il U S Bur Mines Tech Pa 101:1-14 '15
Personal recollections, N. Tesla, il Sci Am 112: 537+ Je 5 '15

Je 5 '15

Polyphase commutator machines and their application. N. Shuttleworth. Inst E E J 53: 439-57; Discussion. 53:457-66 Mr 15 '15 Polyphase induction motors with special ventilation features. il Elec W 66:547-8 S 4 '15 Protecting polyphase motors against phase failure and reversal. il Met & Chem Eng 13: 703-4 O 1 '15 Repulsion start induction motor. J. L. Hamilton, diags Am Inst E E Pro 34:2389-420 O '15

Rewinding direct-current motors and generators, A. A. Fredericks, diags Power 42:76-8, 116-18, 148-50 Jl 20-Ag 3 '15

Rewinding motor for lower frequency, Elec R & W Elec'n 67:565-6 S 25 '15

Scheme for securing 50 r.p.m. from a volt, 250-r.p.m. direct-current motor. V. Clarke. plan Elec W 66:1090-1 N 13 '15

Selection and application of motors. G. Fox. Elec R & W Elec'n 66:348-50 F 20 '15
Selection of electric motors and controllers. S. H. Libby. Foundry 43:60-3 F '15

Small-sized dental motor for direct drive. Il Elec W 65:563 F 27 '15; Elec R & W Elec'n 66:651 Ap 3 '15 Speed characteristics of direct-current motors, A. M. Bennett. Power 41:125-7 Ja 26 '15 Standardization of crane motors. Ry Age (Mech ed) 89:585 N '15 Starting and operating characteristics of single-phase motors. Elec W 65:433-4 F 13 '15 Starting motors. P. M. Heldt. diags Horseless Age 35:882-3; 36:20-1 Je 30-Jl 7 '15 Stationary motors in census report. Elec W

Age 35:882-3; 36:20-1 Je 30-Jl 7 '15
Stationary motors in census report. Elec W
65:39-400 F 13 '15
Subdivision of power as solved by the small
motor, R. E. Barker and H. R. Johnson.
Gen Elec R 18:555-8 Je '15
Synchronous motors for power-factor correction. T. Schou. Elec W 66:1138-42 N 20 '15
Torque characteristics of direct-current motors. A. M. Bennett. diag Power 42:748-52 N
30 '15

30 '15
Two synchronous-motor protection schemes.
E. E. George, diags Elec W 66:142-3 JI 17 '15
Types of fractional-horse-power motors to
employ in different services; abstract. Bernard. Elec W 65:938 Ap 10 '15
Variable speed alternating-current motor of
the Kimble electric company, Chicago. il
Lron Age 95:510 Mr 4 '15
Westinghouse factory sewing-machine motor.
il Elec R & W Elec'n 67:856 N 6 '15; Elec
W 66:1048 N 6 '15
Where electric motors can be used. T: R. Hay.

Where electric motors can be used. T: R. Hay, il Eng M 49:498-516 Jl '15
Why direct-current motors fail to start. F. A. Annett. diags Power 41:194-5. 230-2 F 9-16 '15

See also Armatures; Commutators; Dynamos; Electric controllers; Electric driving; Electric locomotives; Electric machinery; Electric power; Electric transformers

#### Bearings

Ball-bearing induction motors. il Power 42:722

Ball bearings in electric motors, il diag Elec W 66:658-9 S 18 '15 Ball bearings in electric motors, F; H. Poor, il diags Gen Elec R 18:631-5 Jl '15

# Control

Action of phase advancer in regulating power factor of an induction motor, diag Elec W 66:191 JI 24 '15

66:191 Jl 24 '15
Alternating-current controllers for steel mills.
A. Simon, il diags Am Inst E E Pro 34:731-51 My '15; Same. Iron Tr R 57:477-81+, 527-9 S 9-16 '15; Abstract. Elec W 65:1195-6 My 8 '15; Discussion. Am Inst E E Pro 34: 2895-914 N '15
Automatic control of motors in a sewage pumping station. L: R. Vautrot. il diag Sibley J 29:79-87 D '14
Changing speed of three-phase induction motor. W. R. Bankhead. diags Power 41:583-4 Ap 27 '15
Control for electric motors. C. D. Knight. Gen

4 Ap 27 '15 Control for electric motors, C. D. Knight, Gen Elec R 18:303 Ap '15 Direct-current motor-speed regulation by resistance in the armature circuit and the use of diverters; abstract, T: Carter, diag Elec W 66:334-5 O 23 '15 Dynamic braking, Elec R & W Elec'n 66:300-1 F 13 '15

F 13 '15
Float-switch control from two points for motor-driven pump. G. A. Schneider. diags Elec R & W Elec'n 67:606 O 2 '15
How one operator controlled an air-compressor motor and used it to drive a direct-current generator. H. R. Smith. diags Elec W 66:488 Ag 28 '15
Method for controlling 2000-volt induction motor one mile from power house. A. C. Lasher. diag Elec W 66:91-2 Jl 10 '15
Mill controllers. H. F. Stratton. Am Inst E E Pro 34:2899-94 N '15
Weter-speed control. Power 42:55-6 Jl 13 '15

Motor-speed control. Power 42:55-6 Jl 13 '15 Press button control for an electric traverser. il Engineer 119:436 Ap 30 '15

Principles and systems of electric motor control. C. D. Knight. il diags Am Inst E E Pro 34:2915-26 D '15

Electric motors—Control—Continued
Speed regulation of induction motors; abstract, F. W. Meyers, diags Elec W 66:763-4

O 2 15 Variable-speed drives for rolling mills. K. A. Pauly. Power 42:527-8 O 12 '15; Abstract (Two control systems for steel-mill motor drives). diag Elec W 66:865-6 O 16 '15

#### Noises

Electric-motor noises. F. H. Davies, diags Power 41:572-3 Ap 27 '15

#### Nomenclature

What to call alternating-current motors. C. A. Adams. Elec W 66:339 Ag 14 '15 What to call alternating-current motors; discussion. V. A. Fynn; E. Rosenberg. diags Elec W 66:971-5 O 30 '15

# Repair

Keep record of electrical repairs. G. E. Stoltz. Iron Tr R 56:967-9+ My 13 '15; Same cond. (Steel mill electric motors). Iron Age 95:952-3 Ap 29 '15

#### Starting

Data ata on starting torques and starting currents of various motors. Elec W 66:1033 N 6 '15

Wrong field connections. E. C. Parham, diags Power 42:692-3 N 16 '15

# Starting devices

Starting devices

Automatic starting switches for small alternating-current motors, il Elec R & W Elec'n 66:1007 My 29 '15

Case where an instruction tag received with apparatus was needed. E. C. Parham. diag Elec W 66:694 S 25 '15

Cutler-Hammer automatic starters for alternating-current motors, il Elec R & W Elec'n 67:685 O 9 '15; Elec W 66:826 O 9 '15

Improvised motor starter, J: G. Grant, il Eng & Min J 100:842 N 20 '15

Induction-motor starters, il diags Elec W 66:

Induction-motor starters, il diags Elec W 66: 374-5 Ag 14 '15

374-5 Ag 14 '15 Operating factory motors, S. P. Goodale, il diag Elec W 66:533-4 S 4 '15 Starters for induction motors, il Elec W 65: 1203-4 My 8 '15

Starting small motors. A. A. Fredericks. Power 41:345 Mr 9 '15

## Starting resistance

Calculations of starting resistances for rail-way motors. F. Castiglioni. diags Elec Ry J 44:1382-5 D 26 '14; Discussion. 45:186, 238-9, 381 Ja 23-30, F 20 '15

Effects of incorrect starting resistances. J: W. Corning. Elec Ry J 45:93-4 Ja 9 '15

Graphic geometrical progression method for starting-resistance calculation, W. F. Coors. il Elec Ry J 45:761-3 Ap 17 '15

Short method for calculating the starting resistance for shunt, induction, and series motors. B. W. Jones. Gen Elec R 18:131-4

Time element in controller notching. A. M. Buck. Elec Ry J 45:672 Ap 3 '15

# Temperature

Distribution and rise of temperature in field coils; with discussion. M. Maclean, D. J. MacKellar, and R. S. Begg. diags Inst E E J 53:526-33 Ap 1 '15

Temperature of field windings. H. M. Phillips. Elec R & W Elec'n 67:894-5 N 13 '15

### Testing

Calculation of the performance of an induction motor, W. V. Lyon, Elec W 65:1168-70, 1240-2 My 8-15 '15

Methods of testing for short-circuits in field coils, F. J. Foote, diags Elec Ry J 45:64-5 Ja

Single-phase squirrel-cage motor with large starting torque and phase compensation. V. A. Fynn. il diags Am Inst E E Pro 34: 2215-40 O '15

Test of a direct-current motor, H. C. Light-foot, diags Elec R & W Elec'n 67:240-6 Ag 7 '15

#### Ventilation

Modern électric mine locomotive. G. Bright. il Am Inst E E Pro 34:1615-20 Ag '15; Same. Colliery 36:145-6 O '15

See also Electric motors. Railway-Venti-

Electric motors, Railway
Armature removal. R. R. Potter. il Elec Ry J
46:367-8 Ag 28 '15
Baffle plate for motor axle bearing caps of
GE-73 motors. R. Fox. il Elec Ry J 45:424
F 27 '15

Box-frame motor practice. Elec Ry J 46:410-

11 S 4 Box-frame motors and the removal of armatures. H. C. Prather. Elec Ry J 46:915 O

Brush-holder practice for single-phase motors. R. R. Potter, il diag Elec Ry J 46:408-9 S

Calculations of starting resistances for railway motors. F. Castiglioni. diags Elec Ry J 44:1382-5 D 26 '14; Discussion. 45:186, 238-9, 381 Ja 23-30, F 20 '15
Chart for use in transforming motor speed curves for different voltages. F. Castiglioni. Elec Ry J 45:515 Mr 13 '15
Developments in the heat treatment of railway gearing; with discussion. W. H. Phillips. il Eng Soc W Pa 30:737-77 N '14; Abstract. Am Soc M E J 37:237-8 Ap '15
Effect of car-wheel diameter on motor heating. Elec Ry J 46:70 Jl 10 '15
Effect of car-wheel diameter on motor heating. A. L. Broomall. Elec Ry J 46:452-3 S 11 '15

'15
Effect of gear ratio on operating economy. Elec Ry J 46:68-70 Jl 10 '15
Effects of incorrect starting resistances. J: W. Corning. Elec Ry J 45:93-4 Ja 9 '15
Effects of short-circuited field coils—ground and puncture tests. F. J. Foote. diag Elec Ry J 44:1396-7 D 26 '14
Effects of variance in car-wheel diameters on motors. A. S. Langsdorf. Elec Ry J 44:1344 D 19 '14
Evaperiness with field control. H. M. Lloyd.

Effects of variance in car-wheel diameters on motors. A. S. Langsdorf. Elec Ry J 44:1344 D 19 '14

Experiences with field control. H. M. Lloyd. Elec Ry J 46:191 Jl 31 '15

First 5000-volt d. c. railway. J: G. Pertsch. Sibley J 30:72 N '15

5000-volt direct-current railway. diags map Engineer 120:440-1 N 5 '15

5000-volt experimental line of the Michigan United traction company. C. Renshaw. il diags map Ry 8 57:533-6 O 23 '15

Flashing of railway motors; abstract. R. E. Hellmund. Elec W 66:185 Jl 24 '15

GE 240-C motor and PC-2 control. il Elec Ry J 45:1124-5 Je 12 '15

Gears and pinions. R. H. Dalgleish. diags Elec Ry J 45:942 My 15 '15

Graphic geometrical progression method for starting-resistance calculation. W. F. Coors. il Elec Ry J 45:761-3 Ap 17 '15

Handy templets for assembling brush-holder yokes for GE-57 motors. J. N. Graham. diags Elec Ry J 44:1351 D 19 '14

High-tension d. c. tap-field motors for the Central Argenthe railway. il Elec Ry J 45:679-80 Ap 3 '15

Hints on the impregnation of railway motor coils. il Elec Ry J 45:429 F 27 '15

Home-made pinion puller. C. M. Feist. il Elec Ry J 46:641 S 25 '15

How Sloux City reduces motor troubles. C. M. Feist. Elec Ry J 45:508 Mr 13 '15

Home-made pinion puller. C. M. Feist. il Elec Ry J 45:60-1 O 16 '15

Maximum motor input. Elec Ry J 44:1347 D 19 '14

Methods of removing the armature from box frame railway motors. J. L. Booth. il Gen

Methods of removing the armature from box

Methods of removing the armature from box frame railway motors. J. L. Booth. il Gen Elec It 18:998-15 S '15

More notes on regenerative braking. Elec Ry J 45:1101 Je 12 '15

New method to determine railway motor speeds with varying voltage. A. M. Buck. Elec Ry J 46:595-6 S 18 '15

Electric motors, Railway—Continued New motor for one-man cars, it diag Elec Ry J 46:412 S 4 '15

J 46:112 S 4 '15 New York municipal car—motors, control, conduit and collectors. il diags Elec Ry J 45: 496-503 Mr 13 '15 Nominal rating of railway motors. G. H. Hill. Elec Ry J 46:275-6 Ag 14 '15 Operating conditions of railway motor gears and pinions. A. A. Ross. il Gen Elec R 18: 249-58 Ap '15 Operating with 5000-volt direct current. N. W. Storer. il diag map Elec Ry J 46:660-3 O 2 '15

Points on the installation and removal of pinions. R. H. Parsons. diags Elec Ry J 45: 638-9, 674-5 Mr 27-Ap 3 '15
Power consumption of railway motors. H. L. Andrews and J. C. Thirlwall, il Gen Elec R 18:3944-51 O '15
Pressed-steel motors on a Cleveland car. il Elec Ry J 45:1041 My 29 '15
Railway motor characteristic curves. E. E. Kimball, il Gen Elec R 18:296-9 Ap '15
Railway motor commutation and flashing. R. E. Hellmund. Elec Ry J 46:105-6 JI 17 '15

Railway motor gearing. W. L. Allen. Elec Ry J 45:1201-3; 46:111-12 Je 26, Jl 17 '15 Regenerative braking. F. J. Sprague. Elec Ry J 45:1076-7 Je 5 '15 Rejuvenating overloaded motors. W. P. Jackson. il Elec Ry J 46:192-3 Jl 31 '15 Removing pinions from motor axles. A. A. Ross. Elec Ry J 45:800 Ap 24 '15 Selection of city motor equipment. G. Remington. Elec Ry J 45:675-6 Ap 3 '15 Sprague-General electric PC control. C. J. Axtell. il plan Gen Elec R 18:NS-90 O '15 Time element in controller notching. A. M. Buck. Elec Ry J 45:672 Ap 3 '15 Types of motor axle bearings—use of different types for each half. Elec Ry J 45:760 Ap 17 '15 Use of the gas flame in removing pinions.

'15
Use of the gas flame in removing pinions. R. H. Parsons. Elec Ry J 45:988 My 22'15
Wee light-weight street-railway motor. il Elec R & W Elec'n 67:990 N 27'15
Wheel diameter and motor heating. F. J. Foote. Elec Ry J 46:914 O 30'15
Where a single winder maintains 951 motors. J: Sutherland. il Elec Ry J 46:997-8 N 13'15

### Ventilation

Ventilation

Advantages and limitations of railway motor ventilation. R. E. Hellmund, il Elec Ry J 45:833-5, 937 My 1, 15 '15

Motor ventilation. Elec Ry J 45:827 My 1 '15

Motor ventilation. H. H. Adams. Elec Ry J 45:990 My 22 '15

Motor ventilation. P. J. Kealy. Elec Ry J 46: 109 Jl 17 '15

Self-ventilated, million.

109 Jl 17 15
Self-ventilated railway motors. E: D. Priest.
Elec Ry J 45:891-2 My 8 '15
Simple ventilating scheme for increasing
motor output. R. H. Parsons. diag Elec Ry
J 45:1170 Je 19 '15

Electric notation. See Electric symbols Electric omnibuses. See Electric buses

lectric ovens

lectric ovens
Automatically controlled electric oven for testing shrapnel, il Elec R & W Elec'n 67: 488 S 11 '15
Economic operation of electric ovens. P. W. Gumaer, il Am Inst E E Pro 34:1001-32 My '15; Abstract. Elec W 66:66-7 J1 10 '15
Electric oven gives remarkable results in Toronto bakery. Elec R & W Elec'n 66:486

Toronto bakery. Elec R & W Elec'n 66:486 Mr 13 '15 Electrically heated enameling ovens. C. W. Bartlett. il Gen Elec R 18:1130-5 D '15 Electrically heated japanning ovens. C. F. Hirshfeld and W. D. Dygert. il Elec W 66: 930-2 O 23 '15 Gas vs. electrically heated ovens. G: H. Trout. Iron Tr R 57:526+ S 16 '15 Science and the tariff. E. E. Pickrell. il Sci Am S 79:199 Mr 27 '15 6000-kw electric enameling load. il plan Elec W 65:1702-3 De 26 '15 Thermal-insulation tests of electric ovens. A. E. Kennelly, F. D. Everett, and A. A. Prior. diags Elec W 65:779-82 Mr 27 '15 Using electric ovens for enameling. il Iron Tr R 57:215 Jl 29 '15

Electric plants

British Portland cement making machinery; cement works at Aberthaw. il Engineer 119: 448-9 My 7 '15

448-9 My 7 '15 Central generating system for University of Michigan, il plans Elec W 65:646-51 Mr 13

Central generating system for Chirchean Michigan, il plans Elec W 65:646-51 Mr 13 '15 City and state power plants at Columbus, Ohio. T: Wilson, il Power 42:322-6 S 7 '15 Detroit flour-mill plant. T: Wilson, il plan Power 40:870-3 D 22 '14 Electrical plant of the Wakefield iron co. Wakefield, Mich. H. I. Pearl and J. Green, il plan Eng & Min J 100:349-51 Ag 28 '15 Electricity in malting houses; relative merits of isolated-plant and central-station service, if Elec R & W Elec'n 65:1123-5 D 12 '14 Equipment of large publishing house; power plant, interior wiring and special features of the Curtis publishing company's building, Independence square, Philadelphia, il diags plans Elec W 65:965-11 Ap 10 '15 Gas-tractor power plant. C. V. Hull. il plan Power 41:226-8 F 16 '15 Isolated power-house for factories, W. E. Francis, il Gen Elec R 18:1057-65 N '15 Kansas City terminal power plant, il Elec W 65:1468-70 Je 5 '15 Keeping down peaks on power purchased on a peak basis. T. E. Tynes, il diags Am Inst

keeping down peaks on power purchased on a peak basis. T. E. Tynes. il diags Am Inst E E Pro 33:1021-6 Je '14; Discussion. 34:79-

E Pro 33:1021-0 00 1, 84 Ja '15
Life of building power plants. C. M. Ripley. Sci Am S 77:130-1 F 28 '14; Same. Am Soc Heat & V E 20:98-105 '14; Same cond. (How long can a private electric plant run before it has to be replaced?) Am Inst Arch J 2:94-7 F '14; Discussion. Am Soc Heat & V E 20: 106-11 '14

To has to be replaced:) Am Soc Heat & V E 20: 106-11 '14
Lucerne power plant and tipple of the Rochester & Pittsburg coal and iron co. C. M. Young. il Colliery 36:1-6 Ag '15
Motor-driven plant of the Dallas news. A. C. Scott. il plan Elec W 65:462-5 F 20 '15
N. E. L. A. committee report on prime movers: Elec W 65:1512-13 Je 12 '15; Elec R & WElec'n 66:1111 Je 12 '15
Operating data in connection with federal buildings under control of the Treasury department. N. S. Thompson. Heat & Ven 12: 13-17 Jl; 17-20 Ag '15
Operating features of a small plant; details of power-plant layout, operating conditions, condensing arrangements and motor service. il diag Elec W 66:355-7 Ag 14 '15
Power plant of the Acme tea company. il plans Power 40:966-10 D 29 '14
Power plant tof the government printing office. D. H. Tuck. diags plan Power 41:576-80 Ap 27 '15
Power plant testing. W. M. Selvey. diags Engineer 120:432-3, 436 N 5 '15
Problems in power-plant design. (Engineers' study course) C: L. Hubbard. diags Power 40:580-1, 618-20, 655-6, 692-4, 724-6, 758-60, C 20 '14-Ja 12 '15
Rossiter, Pa., power plant. Il Colliery 35:633-6

Rossiter, Pa., power plant. il Colliery 35:633-6

Ji '15
Small aero-electric plant. E. H. Williamson, jr. il Sci Am 113:200-1 S 4 '15
Small isolated plant pays big dividends. T: Wilson. il Power 41:51-4 Ja 12 '15
Storage batteries for handling peak loads. E. Brown. Power 41:470-1 Ap 6 '15
Utilization of waste heat for the generation of electrical energy. H. Hobson. diag Inst E E J 53:844-8 Je 15 '15

Wait turbo-generator on elevator load in the Lumber exchange building, Chicago. il diags Power 42:717-20 N 23 '15

Western newspaper union plant in Chicago. T: Wilson, il plan Power 41:2-5 Ja 5 '15

Why the isolated plant should win. H: D. Jackson, Power 40:846-7 D 15 '14

See also Electric power; Electric railroads—Substations; Electric transmission; Hydroelectric plants; Steam plants

### Central stations

Addition to the Westport power plant. W. O. Rogers, il plan Power 41:390-5 Mr 23 '15

Electric plants—Central stations—Continued
Application of the diversity-factor; abstract.
H. B. Gear. Elec W 65:1515-16 Je 12 '15
Auxiliary station for transmission system; turbine of Mount Holly steam station of the Southern power company operates as synchronous motor when not under load. C. A. Mees. il plans Elec W 65:774-8 Mr 27 '15
Brunots Island generating station. F. Uhlenhaut, jr. il diags plan map Elec W 65:1289-97 My 22 '15
Building a power station upon one in service.

97 My 22 '15
Building a power station upon one in service.
il diag plan Elec W 66:965-7 O 30 '15
Catastrophe reserve for central stations. H. S.
Cooper. Elec W 65:1228 My 15 '15
Central-station development at Portland,
Maine. il diags map Elec W 65:519-22, 590-6
F 27-Mr 6 '15
Central-station systems of India Elec W 66: Central-station systems of India, Elec W 66:

Combination electric heating plant, Laramie, Wyo. A. E. Anderson. il Power 42:602-5 N

Connors creek power plant, Detroit. C. F. Hirshfeld, il diags plans Power 42:388-96 S 14 '15; Same cond. Am Soc M E J 37:499-508 S '15

S 15 Cumberland Edison power plant. W. O. Rogers. il plans Power 42:704-9 N 23 '15 Delray power plants. N. G. Reinicker. il plans Power 42:286-90, 343-4, 414-15, 435-6 Ag 31, S 7, 21-28 '15

Power 42:286-90, 343-4, 414-15, 435-6 Ag 31, S 7, 21-28 '15
Development of the central-station industry in towa. H. W. Wagner. il Elec R & W Elec'n 66:757-61 Ap 24 '15
Developments in steam-electric generating stations. J: Hunter. Power 40:897-9 D 22 '14
Diesel-engine central station at Winchester, Ind.—cost of equipment. T: Wilson. il Power 41:562-4 Ap 27 '15
Diesel-engine installation at Palo Alto. H. Haas. il Power 41:502-4 Ap 13 '15
Economic selection of prime movers. R. Trautschold. Power 42:511-13 O 12 '15
Electric service for small city. J. P. Bowles. Elec R & W Elec'n 66:1052-3 Je 5 '15
Electric service in and near Peoria, Ill. il map Elec W 65:281-5 Ja 30 '15
Electrical year in Canada. A. Sullivan. Elec W 65:7-8 Ja 2 '15
Electrification of the Elkhorn grade, Norfolk & Western Ry. il Ry R 57:101-6 Jl 24 '15
Enlarging a steam reserve station; problems involved in rehabilitating the Consolidated gas, electric light & power company's Westport station. J. C. Lathrop. il diags Elec W 65:161-8 My 8 '15
Extension of the Cos Cob plant. W. O. Rogers. il plan diags Power 41:358-64 Mr 16 '15
Fort Wayne station rebuilt. T: Wilson. il plans Power 42:534-9 O 19 '15
Gas engines replace a steam turbine power plant. C. L. Follmer. il plan Power 42:670-4

Harrisburg, Ill., railway and power plant. T: Wilson, il diag Power 41:698-701 My 25

Havana consolidated power plant. C. W. Ricker, il diags Power 42:218-22, 257-61 Ag 17-24 15

Havana—new power station. C. W. Ricker. il diags Elec Ry J 45:920-5 My 15 '15: Same; with table of electrical equipment. Elec W 65:1233-40 My 15 '15: Abstract. T. C. Ulbright. Sibley J 30:3-10 O '15
Interconnected electric service in Iowa. il map Elec W 65:150-6 Ja 16 '15
Linking up the London electric supply stations. Engineer 120:16-17 Jl 2 '15
Lowellville, Ohio, turbine plant. W. O. Rogers. il diags Power 42:128-42 Ag 3 '15
Metropolitan needs and sizes of prime movers. il Elec W 66:799-801 O 9 '15

Milestones of electrical progress, a review of the Chicago central-station situation. S: In-sull. Elec W 66:737 0 2 15

Mining loads for central stations. W. Sykes and G. Bright. Colliery 35:477-9 Ap '15 Municipal-utility problem at Emporia, Kan.; a central station leased to a progressive syndicate. il Elec W 65:1106-7 My 1 '15

N. E. L. A. New England section 7th annual convention, Elec R & W Elec'n 67:577-83 S 25 '15

Netherlands; extracts from the official report of commission. H. Verhagen. Elec W 66:599

Netherlands; extracts from the official report of commission. H. Verhagen. Elec W 66:599 S 11 '15 New England central stations and the war. H. T. Sands. Elec W 65:7 Ja 2 '15 New York Interborough power plant enlargement. il diags Elec Ry J 45:744-9 Ap 17 '15; Same. Elec W 65:975-9 Ap 17 '15 Norfolk & Western electrification. il Power 41: 830-5 Je 22 '15 Oil-burning stand-by plants. C. H. Delany. Power 42:172-5 Ag 3 '15; Abstract. Elec W 65:1514 Je 12 '15 Oil engine for off-peak load. L. H. Morris. Power 41:351-2 Mr 9 '15 Oswego, N. Y., light and power plant. G. Newell. il plan Power 42:757-8 N 30 '15 Outlook for central stations in Pacific northwest. O. B. Coldwell. Elec W 65:6 Ja 2 '15 Outputs of large generating systems. Elec W 65:826-7 Mr 27 '15 Power plant at Kincaid, Ill. T: Wilson. il diags plans Power 42:430-4 S 28 '15 Power plant of the Hughes electric co. C. P. Larsen. il Power 41:732-5 Je 1 '15 Projected new power station for Manchester. Engineer 119:235-6 Mr 5 '15 Proposed Manchester generating stations. S. L. Pearce. Elec R & W Elec'n 67:672-3 O 9 '15 Recent developments in steam-electric generating stations. J; Hunter. Am Soc M E J 37:223-5 Ap '15 Single-unit power plants. J. C. Hawkins. Power 41:855-6 Je 22 '15 Small electric generating stations; applicability of oil engines for plants in small towns. G: C. Shaad. il plan Elec W 65:923-5 Ap 10 '15 Springfield (Ohio) railway power plant rebuilt without interfering with operation. il diags plan Elec Rel V I 48:282-009 '0 '20 '15

Ap 10 '15
Springfield (Ohio) railway power plant rebuilt without interfering with operation, il diags plan Elec Ry J 46:898-902 O 30 '15
Storage battery for electric plants, J. F. Springer, il Munic J 37:915-17 D 24 '14
System of the Columbus railway and light co. il Power 42:339-41 S 7 '15
Turbogenerators for New Haven and Bridgeport, Conn. il Elec R & W Elec'n 65:1151-2
D 12 '14
Virging power company's Cabin Creek plant.

D 12 '14
Virginia power company's Cabin Creek plant, il diags plan map Elec W 66:239-44 Jl 31 '15
Well designed central station at Durand, Ill. il plan Elec R & W Elec'n 66:642-4 Ap 3 '15
Why the manufacturer prefers to use central-station power, H, H, Holding, Elec W 65: 1231-2 My 15 '15
Wood Green electric generating station, il Engineer 119:503-5 My 21 '15

See also Electric plants, Municipal; Electric service companies; Electric shops; Electric transmission: Electric vehicles and the central station; Hydroelectric plants; Steam plants

Cost of equipment

Central-station investment to serve electric-range load. Elec W 66:706 S 25 '15 Costs of electrical equipment. Elec W 64:1204 D 19 '14 Economics of electric power station design. H. F. Parshall. Elec W 66:690 S 25 '15

Central-station rate making. P. J. Kiefer. Power 42:263-70 Ag 24 '15 Load-factor, output and cost; abstract. C. A. Baker. Elec W 66:20 Jl 3 '15

# Management

Central station management. See weekly num-

bers of Electrical world
Combined operation of steam and hydraulic
power in the Pennsylvania water and power
company system. J; A. Walls. Am Inst E E
Pro 34:2299-2306 O '15

Convenient operating reports for steam plants. Elec W 65:1623-6 Je 19 '15

lectric vehicle situation in New England and other commercial subjects discussed at N. E. L. A. convention, Elec W 65:803-5 Mr 27 '15 Electric

Experiences of small-plant operator; economies effected by high-efficiency oil engine unit. E. B. Pollister. il Elec W 65:1185-6 My 8 '15

ctric plants—Central ment. —Continue Flectric stations-Manage-

Graphic representations of power-plant losses. E. D. Dreyfus. Power 41:638-9 My 11 '15 Ice-making as a by-product of central sta-tions. H. Cochiran. il diags Am Soc M E J 37:369-74 Jl '15

tions H. Cochran. Il diags Am Soc M E J 37:369-74 Jl '15
Load dispatching on large generating and distributing systems discussed before A. I. E. E.; abstracts. P. Kent. Elec R & W Elec'n 67:767-8 O 23 '15; Elec W 66:904 O 23 '15
Load dispatching system of the Columbus railway, power and light company. H. W. Clapp. il Gen Elec R 17:912-14 S '14
Log sheets at Delray station. N. G. Reinecker. Power 42:482-4 O 5 '15
Management of central stations. W. N. Polakov. Eng M 50:52-8, 367-72 O, D '15
Practical operation of central stations. Elec W 65:786-7 Mr 27 '15
Purchased power for the steel mill; economic advantages of central station current. C. S. Lankton. Iron Tr R 57:573-5 S 23 '15
Residential load characteristics. Elec R & W Elec'n 66:946 My 22 '15
Selling current on a small margin; a small water and steam plant. T. Wilson. il diags Power 42:498-501 O 12 '15
Supervising 840 miles of lines; how the load dispatcher of the San Joaquin (Cal.) system adjusts even plant water supply. L. J. Moore. il map Elec W 65:1422-4 My 29 '15
Supplemental power for hydroelectric systems. J. F. Vaughan. Am Inst E E Pro 34:2307-19 O '15
Work of the load dispatcher. R. R. Robley.

J. F. O '15

Work of the load dispatcher. R. R. Robley. il diag Elec W 65:1418-21 My 29 '15 See also Electric service companies

# Records

Meter-record forms for a small central station. Elec W 66:255-6 Jl 31  $^{\prime}15$  Motor-service data at a glance, il Elec W 66: 370 Ag 14  $^{\prime}15$ 

# Statistics

Analysis of central-station practice in Wisconsin regarding rural service. Elec R & W Elec'n 66:237-9 F 6 '15

Elec n 66:237-9 F 6 15
Better business in generating field. Elec W
65:726-8 Mr 20 '15
Census of employees and wages. Elec W 65:
600 Mr 6 '15
Census of generating equipment. Elec W 65:
291-2 Ja 30 '15
Census of primary power equipment diag Flea

291-2 Ja 30 '15
Census of primary power equipment, diag Elec W 65:215-16 Ja 23 '15
Census report on capitalization. Elec W 65: 467-9 F 20 '15
Central electric stations; relative number and capacity of municipal and private plants. Munic J 39:253-4 Ag 19 '15
Central-station conditions. Power 41:827 Je 15

Central-station conditions. Power 41:827 Je 15

Central-station gains. Elec W 66:177-9 Jl 24

Central-station operations: totals of income

Central-station operations: totals of income and output in first four months of war period show an increase. Elec W 65:473-5 F 20 '15 Central-station returns for first quarter of 1915 show better gains than last quarter of 1914. Elec W 65:1610-12 Je 19 '15 Continued gain in light and power industry. Elec W 66:456-8 Ag 28 '15 Electric lighting data: station equipment—amount of current used for street lighting and other purposes—fuel statistics—number and kind of lamps used for street lighting—ornamental lighting—rates. Munic J 38:884-94 Je 24 '15

ornamental lighting—rates. Munic J 38:884-94 Je 24 '15
Facts and factors of California. Elec R & W Elec'n 66:1028 Je 5 '15
Facts and factors of Iowa central stations. Elec R & W Elec'n 66:818-19 My 1 '15
Industrial improvement reflected; central-station gains in output of electrical energy for January and February. Elec W 65:1242-4 My 15 '15 15

Interconnected systems serving San Francisco; details of the generating equipments and transmitting circuits, il diags map Elec W 65:1356-82 My 29 '15

Iowa central-station facts and factors. Elec W 65:1128-9 My 1 '15

Massachusetts electric companies show decided gains. Elec R & W Elec'n 67:604 O 2 '15

Operating data and costs for Coffeyville, Kansas plant serving city of 15,000. Elec W 66: 866-7 O 16 '15
Operating expenses of Massachusetts steam stations. Elec W 66:302-3 Ag 7 '15
Stability in the central-station industry. F: Nicholas, Elec W 66:722-4 S 11 '15
Steady increase in light and power operations. Elec W 66:1025-7 N 6 '15
Substantial growth in the central-station field. Elec W 66:748-50 O 2 '15

Power plant testing. W. M. Selvey. diags Inst E E J 53:109-18; Discussion. 53:118-45, 191-8, 743-7 Ja 1-15, My 15 '15

#### Valuation

Valuation of Milford, Mass., utility property. Elec R & W Elec'n 67:751-2 O 23 '15

# Cost

esign, construction and unit costs of the power house for the new smelter of the Ari-zona copper co., ltd., Clifton, Ariz. diags plans Eng & Contr 42:262-5 S 16 '14 See also Hydroelectric plants-Cost

### Damages from floods

Power plant and the Ohio flood, F. C. Caldwell, Sibley J 29:175-8 Mr '15

Load curves

Load curves

Electricity for irrigation pumping. il Elec R & W Elec'n 66:1022-8 Je 5 '15

Irrigation pumping in the coast states. il map Elec W 65:1399-1408 My 29 '15

Load curve relief map. M. Du Bois. Elec W 66:137 Jl 17 '15

Operation at Delray station. N. G. Reinicker. Power 42:414-15 S 21 '15

Striking form of load-curve chart used to obtain municipal loads. Elec W 66:1035 N 6 '15

Supervising 840 miles of lines; how the load dispatcher of the San Joaquin (Cal.) system adjusts even plant water supply. L. J. Moore, il map Elec W 65:1422-4 My 29 '15

Work of the load dispatcher R. R. Robley. Il diag Elec W 65:1418-21 My 29 '15

# Management

Controlling the cost of electricity. W. N. Polakov. Eng M 49;235-40 My '15 Record keeping in the power plant. S. J. H. White. Power 41:243-4 F 16 '15

See also Electric service companies-Management

# Substations

A. C. service from battery, J. A. Walton. diags Elec W 66:975-6 O 30 '15 Cement-plant substation for receiving Mis-sissippi river power, il Elec R & W Elec'n 66:1040 Je 5 '15

Central-station development at Portland, Me. il diags Elec W 65:590-2 Mr 6 '15 Cooling-water pond and system for a city substation. F. Buch, diag Elec W 65:297-9 Ja 30 '15

30 '15
Development and operation of outdoor substations. F. L. Hunt. Elec R & W Elec'n 67: 845-7, 936-7 N 6, 20 '15
45,000-kw. synchronous converter substation of the Aluminum company of America at Massena Springs, N. Y. J. L. Burnham and R. C. Muir. il diag Gen Elec R 18:873-8 S '15
Georgia-Carolina company transmission system, il diags Elec W 66:1189-91 N 27 '15

High-capacity outdoor substation on high-tension line. il Elec R & W Elec'n 66:1212 Je 26 '15; Elec W 65:1644 Je 19 '15

Hydroelectric development on Bishop Creek, Cal. C. O. Poole. Elec W 64:1093-4, 1193-6 D 5, 19 '14

Installing a 2000-kw substation in fifteen days. il Elec W 65:607 Mr 6 '15

Large-capacity outdoor substations for industrial service. il Elec R & W Elec'n 67:253 Ag 7 '15

Largest industrial substation served by Boston Edison system. il Elec W 66:695 S 25 '15 Model factory substation at Worcester, Mass. il Elec R & W Elec'n 66:1196-7 Je 26 '15

Electric plants—Substations—Continued

New combination substation of the Philadelphia electric company. il Elec R & W Elec'n 67:67-8 Jl 10 '15

One boiler room instead of fifty; Cabin Creek plant of the Virginia power company. il diags Elec W 66:286-91 Ag 7 '15

200,000-volt portable substation. C: I. Burkholder and N: Stahl. il diags Am Inst E E Pro 34:209-20 F '15: Abstract and discussion. Elec W 65:525-6 F 27 '15; Discussion. Am Inst E E Pro 34:2582-3 O '15

Outdoor-indoor design of substation at East St. Louis, Ill. il plan Elec W 66:802-4 O 9 '15

Outdoor substation for railway signal work, Elec R & W Elec'n 66:649-50 Ap 3 '15

Outdoor substation of large rating for industrial service. il Elec W 66:424 Ag 21 '15

Plant problem solved by purchased service; American manufacturing company, Brooklyn. il Elec W 66:68-33 S 18 '15

Service re-established at Keohler mine within fifty hours after total destruction of substation. il Elec R & W Elec'n 66:547-8 Mr 20 '15

66,000-volt outdoor substation of small rating

66,000-volt outdoor substation of small rating in the Niagara district. il Elec W 66:867 O 16 '15

Sub-station efficiencies. Engineer 119:165 F 12

Substation of Lancaster Edison compact arrangement of transformer switching equipment. il Elec W 65:1 company 65:1033-5 Ap 24 '15

Substation to serve New York theater district. il plans Elec W 66:1020-3 N 6 '15 Substations for industrial plants. il Elec W 65:663-4 Mr 13 '15

See also Electric railroads-Substations

#### Valuation

Evaluating the isolated plant. R. W. Rollins; H. H. Holding; A. Williams. Elec W 65: 772-3 Mr 27 '15

Water supply

Solving feed-water and condensing water problems at Kokomo, Ind. diags Elec W 65: 1048 Ap 24 '15

Electric plants, Municipal
British municipal station report; abstract. Elec
W 66:1210 N 27 '15

Census of municipal plants. Elec W 65:161-2 Ja

Central electric stations; relative number and capacity of municipal and private plants. Munic J 39:253-4 Ag 19 '15

ity and state power plants at Columbus. Ohio. T: Wilson. il Power 42:322-3 S 7 '15 costs near esti-

Cleveland municipal electric of mate. Eng N 74:859 O 28 '15 Cleveland municipal light plant. Munic J 39: 398 S 9 '15

Cleveland municipal plant developments. Elec W 65:1647-8 Je 19 '15

Cleveland's municipal electric light plant. il diags Munic J 38:869-75 Je 24 '15

Columbus municipal plant earns profits, Elec

W 66:179 J1 24 Columbus, Ohio—decision for municipal light plant, Power 41:354-5 Mr 9 '15

Cost of combination electric service; investigation at Calgary, Alberta. Elec W 65:1181-3 My 8 '15

Danville's municipal power plant. il Munic J 38:876-7 Je 24 '15

Data on municipal-plant operation in Okla-homa. Elec W 65:1573-4 Je 12 '15

Derby electricity undertaking. Elec W 66:250 Jl 31 '15

Design and operation of the Cleveland municipal electric light plant: abstracts, with discussion. F: W. Ballard. il diags Am Soc M E J 37:104-11 F '15; Power 41:104-8 Ja 19 '15; Abstract of discussion. Elec W 64:1139-40 D

Detroit's municipal lighting plant. T: Wilson. il plan Power 40:832-5 D 15 '14

Electric light plant of South Norwalk, Conn. il Munic Eng 49:137-40 O'15

Engineering features of Cleveland station, il Elec W 65:1619-22 Je 19 '15
English electricity works conference, Elec R & W Elec'n 67:295 Ag 14 '15
Extracts from annual report of the municipal plant of Shanghai, T. H. U. Aldridge, Elec W 66:298 Ag 7 '15
Glendale municipal electric lighting plant, L. R. W. Allison, Power 42:60-1 Jl 13 '15
Holyoke gas and electricity, Munic J 38:258
F 25 '15

Increasing the capacity of the Winnipeg municipal electric works. Eng N 73:746-7 Ap 15 15

The Kalamazoo municipal plant. T: Wilson. il plans Power 41:218-24 F 16 '15 Load-factor, output and cost; abstract. C. A. Baker. Elec W 66:20 Jl 3 '15 Massachusetts municipal electric plants. Elec R & W Elec'n 67:905 N 13 '15 Municipal electric light plants: rates. Munic Eng 48:111-12 F '15 Municipal electric-lighting plants in Cali-

Municipal electric light plants: rates. Munic Eng 48:111-12 F '15
Municipal electric-lighting plants in California. Eng N 73:338-9 F 18 '15
Municipal operation in Pasadena, Cal.; analysis and review of annual reports. Elec W 65:1171-3 My 8 '15
Municipal water and light plant of Kansas City, Kansas. P. W. Morgan. il Munic Eng 48:284-5 My '15
New plant at the Stepney electricity works. il diags Engineer 120:385-8, 390 O 22 '15
Opelousas' municipal lighting plant. A. C. Jones il Power 41:41-2 Ja 12 '15
Sale of current to municipally owned distributing systems by central stations. W. R. Collier. Elec R & W Elec'n 67:390-3 N 13 '15
Seattle municipal lighting plant. W. L. Kidston. il plans Power 41:482-5 F 9 '15
Steam-generating methods, Cleveland municipal plant. A. D. Williams. il Power 41:631-3 My 11 '15
Waterloo municipal waterworks and electric light plant. Elec R & W Elec'n 66:77-8, Ja 9 '15

See also Hydroelectric plants, Municipal

Electric potential

Ionizing potential of an X-ray tube. E. C. Drew. bibliog il diag J Fr Inst 179:697-709 Drew. Je '15

See also Electric currents; Electromotive force

Electric power

Absolute dependability of central-station power, il Elec W 65:1255-6 My 15 '15 Buying power for the rolling mill. B. Wiley and W. Sykes. Iron Tr R 57:530-3 S 16 '15

Centrifugal pump from standpoint of central station. T. D. Rose, il Elec R & W Elec'n 67:7-12 Jl 3 '15

Development of electric power for industrial purposes in India. H. R. Speyer. Inst E E J 53:597-604 Ap 15 '15

Distribution of power in electric generating stations; census reports. A. A. Potter and W. A. Buck. Elec W 65:995-6 Ap 17 '15

Electric-furnace power loads; abstract. F. T. Snyder. Elec W 65:1527 Je 12 '15

Electric power industry. D: B. Rushmore. il map Gen Elec R 18:427-39 Je '15

Electricity in grain elevators. H. E. Stafford. il diags Am Inst E E Pro 34:1087-1103 Je '15; Abstract. Elec W 66:90 Jl 10 '15

Electricity in manufacturing. Power 40:901-2

Features of central station power, E. Chesrown, Iron Tr R 57:583-4 S 23 '15

Government as a buyer of power, A. P. Connor, Power 41:636 My 11 '15

Industrial applications of electricity, A. R. Bush. il Gen Elec R 18:460-82 Je '15

Keeping down peaks on power purchased on a peak basis. T. E. Tynes, il diags Am Inst E E Pro 33:1021-6 Je '14; Discussion, 34:79-84 Ja '15

Possibilities open to the central station in solving the freight terminal problem, J. A. Jackson, Gen Elec R 18:1142-4 D '15

Power reel for cars, trucks, etc. R. H. Parsons. diags Elec Ry J 45:894-5 My 8 '15

Electric power —Continued
Subdivision of power as solved by the small motor. R. E. Barker and H. R. Johnson. Gen Elec R 18:555-8 Je '15
Using volcanic steam for the production of electrical energy. il Sci Am 112:97-8 Ja 30 '15

\*\*Re also Electric distribution; Electric driving; Electric motors; Electric plants; Electric transmission; Electric units; Electricity in mining; Electricity on the farm; Hydroelectric power

See Power cost

#### Economy

Avoiding the no-load losses in transformers; abstract. B. Thierbach. Elec W 65:1117-18 My 1 '15

aw of power-house economy: abstract. R. H. Parsons. Ind Eng 14:467-8 D '14

#### Rates

Art of rate-making. A. Dow. Elec W 65:17-18 Ja  $^2$  '15

Art of rate-making. A. Dow. Elec W 65:11-18
Ja 2 '15
Best control of public utilities. F. G. Baum.
Am Inst E E Pro 34:1-23 Ja '15; Abstract.
Elec W -65:258-9 Ja 23 '15
Central-station rate bill opposed at Boston.
Elec W 65:441 F 13 '15
Central-station rate making. H: D. Jackson.
Power 42:626 N 2 '15
Central-station rate making. P. J. Kiefer.
Power 42:68-70 Ag 24 '15
Charge for surplus power. H. G. D. Nutting.
Elec W 64:1208 D 19 '14
Charging for energy; abstract. Bueggeln. Elec
W 65:859 Ap 3 '15
Class rates for light and power systems or
territories. F. G. Baum. Am Inst E E Pro
34:485-505 Ap '15; Abstract. Elec W 66:67
Jl 10 '15
Combined flat rate and meter rate; abstract.

Ombined flat rate and meter rate; abstract. F. Punga. Elec W 65:788-9 Mr 27 '15 Comparison of electric light and power rates. J. C. Dickerman. Power 42:8-15 Jl 6 '15 Computation of a rate. Power 41:419-20 Mr 23

Development of the supply of electricity in Great Britain. A. H. Seabrook. Elec R & W Elec'n 66:761-2 Ap 24 '15

Factors in enter-making. A. S. Ives. Elec W 65:655-7, 783-6, 987-9 Mr 13, 27, Ap 17 '15 Government furnishes cheap electricity in southern Idaho. H. B. Walker. Power 41:228-9 F 16 '15 9 F 16 '15 Hood River

ood River gas and electric company rate decision. Elec R & W Elec'n 67:191-2 Jl 31

ouston, Texas, has co-operative lighting franchise. P. H. Sheldon. Munic Eng 48:41-3 Houston.

Ja '15
Indianapolis electric rate cases. Elec R & W Elec'n 67:235-7 Ag 7 '15
Marlborough electric company; rate decision. Elec R & W Elec'n 66:1063-4 Je 5 '15
Massachusetts hearing on rates. Elec R & W Elec'n 66:347 F 20 '15
Merchants heat and light company, Indianapolis; decision of commission. Elec R & W Elec'n 67:287-8 Ag 14 '15
Multiplex cost and rate system. O: B. Goldman. Am Inst E E Pro 34:941-57 My '15; Discussion. 34:2662-5 N '15
N. E. L. A. committee report on rate research. Elec W 65:1527-8 Je 12 '15
New rate schedule at Sioux City, Iowa. Elec R & W Elec'n 67:232 Ag 21 '15
New rates of New York Edison company. Elec W 65:1159-60 My 8 '15
New York Edison company; opinion and order of the first district commission. Elec R & W

the first district commission. Elec R & W Elec'n 67:802-4 O 30 '15

New York rate reduction accepted. Elec W 65: 828 Mr 27 '15
Northwest light and water company; decision of commission. Elec R & W Elec'n 67:976-7 N 27 '15

Point five tariff. A. S. Blackman and T: Roles. Elec W 66:185-6 Jl 24 '15

Power-factor as element of rates. F. Ghilardi. Elec W 66:410-11 Ag 21 '15

Railway power rates in Chicago. Elec Ry J 46:138 Jl 24 '15

Rate discrimination in Massachusetts. H: D. Jackson. Power 41:543-50 Ap 20 '15
Rates and by-products. J. R. Cravath. Elec W 65:1029 Ap 24 '15
Rates and rate making. P. M. Lincoln. diags Am Inst E E Pro 34:2175-2214 O '15; Abstract. Elec R & W Elec'n 67:722-3 O 16 '15
Rates for light and power; tabulation. Munic J 38:893 Je 24 '15
Reasons for different rates. Power 41:550-1, 684-5 Ap 20, My 18 '15
Reasons for different rates. C: R. Seed. Power 41:383 Mr 16 '15
Ressale of energy by customer to second central station. Elec W 66:704-5 S 25 '15
Rhinelander (Wis.) power company. Elec R & W Elec'n 66:588-9 Mr 27 '15
Service rates and power-factor. Elec W 66:1209

Service rates and power-factor. Elec W 66:1209 N 27 '15

N 27 '15
Simplified rate schedule of Springfield, Mass., company. Elec R & W Elec'n 67:753 O 23 '15
Tariff in China (central station). L. Schmidt-Harms. Elec W 66:138 JI 17 '15
Tendencies in central-station rate-making. F:
Nicholas. Elec W 66:907-9 O 23 '15
Theories of electric current rate schedules.
H: D. Jackson. Eng M 48:728-31 F '15
Uniform electric rates based on costs. H: D.
Jackson. Elec W 66:60, 236-7 JI 10, 31 '15
Uniform electric rates based on costs. W:
Adams. Elec W 65:1666-7; 66:124-5 Je 26,
JI 17 '15

Adams. Elec W 65:1005-7; b6:124-5 Je 2b, Jl 17 '15
Value of the service in rate-making. H. H. Holding. Elec W 65:1031-2 Ap 24 '15
Waterloo municipal waterworks and electric light plant. Elec R & W Elec'n 66:77-8 Ja 9

Electric power, Sale of. See Electric service companies

Electric power distribution. See Electric distribution; Electric transmission

Electric precipitation

lectric precipitation
Abstracts of papers on electrical precipitation presented before the American institute of electrical engineers. Elec R & W Elec'n 66:393-4 F 27 '15; Elec W 65:527 F 27 '15; Met & Chem Eng 13:160 Mr '15
Condensing silver-refinery fume by Cottrell process. C: H. Aldrich, Eng & Min J 100:681
O 23 '15

Electrical precipitation of dust. Iron Age 95: 449-50 F 25 '15 Electrical precipitation of suspended matter. Mach 21:770 My '15; Same. Sci Am S 80: 263 O 23 '15

263 O 23 '15
Electrical precipitation: theory of the removal of suspended matter from fluids. W. W. Strong. Am Inst E E Pro 34:229-36 F '15; Discussion. 34:2646-52 N '15
Electrical process for detarring gas. F. W. Steere. il diag Met & Chem Eng 12:775-8 D'14; Same. Am Gas Inst Pro 9:pt 1, 178-89 '14; Same cond. Eng N 72:1007 N 19 '14; Same cond. Eng M 48:736-9 F '15; Discussion. Am Gas Inst Pro 9:pt 1, 189-99 '14 Gas volume and dust concentration determination in connection with the Cottrell process. W: N, Drew. diags Am Soc M E J 37: 676-8 D '15
Historical sketch. F. G. Cottrell. An Inst E E

676-8 D '15
Historical sketch, F. G. Cottrell, An Inst E E
Pro 34:625-34 Ap '15
Metallurgical smoke, C: H. Fulton, diags U S
Bur Mines Bul 84:59-65 '15
Practical applications of electrical precipitation and progress of the Research corporation, L. Bradley, bibliog il Am Inst E E
Pro 34:523-65 Ap '15; Abstract, Eng M 49:
426-7 Je '15; Discussion, Am Inst E E Pro
34:2646-52 N '15

Preventing smoke electrically, H. C. Wolf, il Elec W 66:692-3 S 25 '15

Solution of smoke, fume and dust problems by electrical precipitation. L. Bradley. Met & Chem Eng 13:911-14 D 1 '15

Theoretical and experimental consideration of electrical precipitation. A. F. Nesbit. il diags Am Inst E E Pro 34:507-22 Ap '15; Discus-sion. 34:2646-52 N '15

Treatment of silver-furnace fumes by the Cottrell process; abstract with discussion. C. H. Aldrich. Elec R & W Elec'n 67:626-7 O 2 '15

Electric propulsion of ships. See Ship propulsion, Electric

Electric protective apparatus

Apparatus Apparatus
Apparatus for protecting against surges. il Elec W 66:421-2 Ag 21 '15
Automatic protective switchgear for alternating-current systems. E. B. Wedmore. diags Inst E E J 53:157-68 Ja 15 '15; Same cond. Engineer 119:236-7, 268 Mr 5-12 '15; Abstract. Elec R & W Elec'n 66:28 Ja 2 '15; Discussion. Inst E E J 53:169-83, 374-86, 605-8 Ja 15, Mr 1, Ap 15 '15
Balance systems of protection; abstract. C. C. Garrard. diag Elec W 65:1684 Je 26 '15
Control and protection of electric systems. C: P. Steinmetz. J Fr Inst 180:1-16 Jl '15; Same. Gen Elec R 18:887-94 S '15; Same cond. Power 42:176-7 Ag 3 '15; Same cond. Sci Am S 80:202-3 S 25 '15
Discussion on reactance by American institute of electrical engineers. Am Inst E E Pro 34: 13:99-22 Je '15

1309-22 Je

Dostal dropout, il diag Elec R & W Elec'n 67: 634 O 2 '15

634 O 2 '15
Explosion-proof apparatus. W. Baum, Am Inst E. E. Pro 34:2680-6 N '15
Feeder protective system. il diags Elec W 65:991-2 Ap 17 '15
Four years' operating experience on a hightension transmission line. A. Bang. diags pls Am Inst E. E. Pro 34:1440-5 Jl '15; Abstract. Elec W 66:11 Jl 3 '15
Fused transformer cut-out. diag Elec W 66: 772 O 2 '15

0

772 O 2 '15

High-capacity pole-type cutout, il Elec R & W Elec'n 67:631-2 O 2 '15

High voltage arrester for telephone lines, E. P. Peck, il Gen Elec R 18:189-94 Mr '15

High-voltage, high-capacity cutout, il Elec R & W Elec'n 66:510-11 Mr 13 '15

Low-gravity cutout for storage battery, W: E. Dixon, diag Power 41:720 My 25 '15

Metropolitan inclosed service switch and meter-protecting device, il Elec R & W Elec'n 66:129 Ja 16 '15

Palmer inclosed service switch and meter-protecting device, il Elec R & W Elec'n 66:270-1 F 6 '15

Proper construction of earth connections. G. H. Rettew. Gen Elec R 18:904-7 S '15; Abstract. Engineer 120:462 N 12 '15 Protecting linemen when using telephone circuits paralleling transmission lines, il Elec W 66:812 O 9 '15

W 66:812 O 9 '15
Protecting synchronous converters, plan Power 42:171-2 Ag 3 '15
Protection against over-pressure, Elec W 65: 74-5 Ja 9 '15
Protection and control of industrial electric power, C: P. Steinmetz, il Gen Elec R 18: 979-85 O '15
Protection of direct surrent generators, discontinuous discontinuous

Protection of direct-current generators, diags Elec R & W Elec'n 67:517-19 S 18 '15 Protection of high-tension circuits against dangerously high voltages; abstract. K, Edg-cumbe, diags Elec W 65:94 Ja 9 '15

Protective apparatus for alternating-current tie lines. il Elec W 66:602 S 11 '15

Protective reactance coils. il diags Elec W 65: 945-9 Ap 10 '15

Relay for protecting single a. c. tie lines. il diag Elec Ry J 46:599-600 S 18 '15

Safety-first features of electrical construction. N. G. Meade, diags Elec R & W Elec'n 66: 764-6 Ap 24 '15

Subway-type high-tension oil fuse cutouts. il diag Elec R & W Elec'n 66:700-1 Ap 10

Theoretical investigation of electric transmisneoretical investigation of electric transmission systems under short circuit conditions. I. W. Gross. Am Inst E E Pro 34:25-69 Ja '15; Abstract, with discussion. Elec W 65:163-4 Ja 16 '15; Discussion. Am Inst E E Pro 34: 2851-68 N '15

Trouble near wireless stations. Elec R & W Elec'n 67:900 N 13 '15

2500-volt primary cut-out box. il Elec W 66: 996 O 30 '15

Two synchronous-motor protection schemes. E. E. George. diags Elec W 66:142-3 J1 17 E.

See also Electric circuit breakers; Electric engineering—Safety devices and r Electric fuses; Lightning arresters devices and measures;

Electric radiators

Experiments on the heating of screw-socket lampholders, C. C. Paterson, il diags Inst E E J 53:14-17 D I '14
Lee electric radiators, il Elec R & W Elec'n 67:990-1 N 27 '15

Mantel-type electric radiators. il Elec R & W Elec'n 66:315 F 13 '15

Electric railroads

Electric railroads

Annual convention of C. E. R. A., Indianapolis, Ind., Feb. 25-26. Elec Ry J 45:411-13, 455-61 F 27-Mr 6 '15

C. E. R. A. November meeting. Elec Ry J 46:1038-9, 1075-80 N 20-27 '15

Convention of Pennsylvania association. Elec Ry J 44:1293-9 D 12 '14

Graphic method for speed-time and distance-time curves. E. C. Woodruff. Am Inst E E Pro 33:1689-92 N '14; Discussion. Am Inst E E Pro 34:2804-46 N '15; Abstract. Elec Ry J 44:1155-6 N 21 '14

Illinois electric railway association discuss economies in power consumption, feeder-tap protection and care of commutators, and one-man cars. Elec Ry J 45:626-8 Mr 27 '15

The industry and the association. C. L. Allen Elec Ry J 46:701-4 O 9 '15; Excerpt (Steam railway sentiment from an electric railway source Ry R 57:484-5 O 16 '15

New York electric railway association 33d annual convention, June 29-30. Elec Ry J 46:14-20 Jl 3 '15

Recent electrical progress. Engineer 119:11-12

Recent electrical progress. Engineer 119:11-12 Ja 1 '15

Recommendations of Interstate commerce commission and parts of report of general interest to electric railways. Elec Ry J 44:1358-9 D 19 '14

D 19 '14
Review of electric railways. Elec ky J 44:1358-9
G. H. Hill. il Gen Elec R 18:444-53 Je '15
Seven years of operating experience of a single-phase interurban railway; Chicago, Lake Shore & South Bend railway, il map Elec Ry J 46:940-5 N 6 '15
Starting resistance of electric cars. F. E. Wynne, Elec Ry J 46:401-2 S 4 '15
Train resistance of electric cars at starting. D. D. Ewing, Elec Ry J 46:279-80, 637 Ag 14, S 25 '15
20th quarterly meeting of N. Y. E. R. A. at Lake George, March 2-3. Elec Ry J 45:464-7 Mr 6 '15
See also Car houses: Cars. Electric lines.

See also Car houses; Cars; Electric lines; Electric locomotives; Electric motors, Railway; Elevated railroads; Interurban railroads; Railroads—Electrification; Street cars; Street railroads; Subways; Suspended railways

Accounting

American electric railway association; Accountants' papers and proceedings. Elec Ry J 46:736-44 O 9 '15

Analyzing the balance sheet. L. T. Hixson. Elec Ry J 45:1112-13 Je 12 '15

Annual meeting of C. E. R. A. accountants. Elec Ry J 44:1334-7 D 19 '14

Banner year in accounting progress. Elec Ry J 45:9-10 Ja 2 '15

Central electric railway accountants' associations.

J 45.3-10 3a 2 10 Central electric railway accountants' associa-tion 27th meeting. Elec Ry J 45:1151-4 Je

Electric railway accounting review. P. V. Burington. Elec Ry J 46:720-1 O 9 '15 Importance of accrued accounts. J: F. Forbes. Elec Ry J 46:809-10 O 16 '15

Simple work-order system. M. W. Glover. Elec Ry J 46:441-2 S 11 '15

Timekeeping and cost records for way department. S. Gausmann. Elec Ry J 46:596-8 S

Value of railway statistics. G: B. Willcutt. Elec Ry J 46:705-7 O 9 '15

Way records. E. P. Roundey. Elec Ry J 45: 945-6 My 15 '15

Way records on cost per section basis. F. W. Hulett. Elec Ry J 45:669-71 Ap 3 '15 Who should keep Way department time? Elec Ry J 46:635-6 S 25 '15

### Advertising

Advertising car in Boston. il Elec Ry J 46:149 Jl 24 '15

# Electric railroads—Continued

Is the handling of free baggage a traffic error? C: J. Laney. Elec Ry J 45:412-13 F 27 '15

# Coasting

Ampere-hour meters on the Annapolis short line. Elec Ry J 45:722-3 Ap 10 '15 Coasting; Denver tramway gave experience with coasting clocks, showing resulting energy economy. H. P. Fligg. Elec Ry J 45: 705-6 Ap 10 '15

705-6 Ap 10 '15
Coasting recorders in New York, il Elec Ry J 45:572-5 Mr 20 '15
Coasting records of Northern Texas traction company, il Elec Ry J 45:1198-1200 Je 26 '15
Reduction in power cost effected by the use of coasting recorders. W. R. Alberger, Elec Ry J 46:520-1 S 18 '15

elation between car operation and power consumption. J. F. Layng. Gen Elec R 18: Relation

consumption. J. F. Layng, Gen Elec R 18: 973-6 O '15
Scientific coasting at Oakland. il Elec Ry J 46:268-71 Ag 14 '15
Use of coasting recorders results in economies at Vancouver. W. G. Murrin. il Elec Ry J 46:573-4 S 18 '15

#### Construction

Catenary construction of New York, West-chester and Boston railway. S. Withington. il diags plans J Fr Inst 178:705-42 D '14
Construction, maintenance and cost of overhead contact systems; catenary construction. F. Zogbaum. Am Inst E E Pro 34:1267-81 Je '15; Abstract. Elec Ry J 46:56-7 Jl 10 '15
Contact conductors and collectors for electric railways. C. J. Hixson. il diags Am Inst E E Pro 34:1477-90 Ag '15; Abstract. Elec Ry J 46:60-1 Jl 10 '15
Contact system of the Butte, Anaconda & Pacific railway. J. B. Cox. il diags map Am Inst E E Pro 34:1447-76 Ag '15; Same. Gen Elec R 18:342-59 Ag '15
Dead-ending feeders to metal poles. G. H. M'Kelway. il Elec Ry J 45:143-4 Ja 16 '15
Discussion on contact systems for electric railroads. (See Proceedings for June and August, 1915) Am Inst E E Pro 34:3068-77 D '15

Electrolysis mitigation in Springfield and New Elyria, Ohio. Elec R & W Elec'n 67:435 S

4 '15
High-voltage third-rail construction, A. H.
Tracy. diags Elec Ry J 45:469-70 Mr 6 '15
Michigan railway—first 2400-volt third-rail
line is built. il Eng Rec 72:40-1 Jl 10 '15
Michigan railway's 2400-volt, third-rail line. il
diags map Elec Ry J 45:1144-9 Je 19 '15;
Abstract. Eng M 49:753 Ag '15

New heavy electric railroad opened in Michigan. diags Eng N 74:212-13 Jl 29 '15

Overhead contact systems, construction and costs. E. J. Amberg. pls Am Inst E E Pro 34:1255-66 Je '15; Abstract. Elec Ry J 46:56 Jl 10 '15

Overhead electrolysis and porcelain strain insulators. S. L. Foster. il Am Inst E E Pro 34:1549-58 Ag '15; Abstract. Elec Ry J 46: 582-3 S 18 '15

Pennsylvania electrification at Philadelphia. il \_ Elec R & W Elec'n 67:923-8 N 20 '15

Pennsylvania inaugurates electric service in Philadelphia. il diag Eng Rec 72:590-3 N 13 '15

Pennsylvania R. R. electrification at Philadelphia, il map Ry Age 59:889-94 N 12 '15
Pennsylvania R. R. electrifies Philadelphia district. il map Eng N 74:930-3 N 11 '15
Pennsylvania R. R. B. Philadelphia Pacification

Pennsylvania R. R.—Philadelphia-Paoli elec-trification. il diags Elec Ry J 46:980-9 N 13 '15

Pennsylvania railroad's suburban line at Philadelphia electrification, il diags map Ry R 57:611-19 N 13 '15
Progress on the Chicago, Milwaukee & St. Paul electrification, il Elec R & W Elec'n 67:769-71 O 23 '15; Elee Ry J 46:794-8 O 16 '15; Eng Rec 72:518 O 23 '15; Ry R 57:556-8 O 30 '15; Power 42:645-6 N 9 '15
Railway return circuits, F. V. Skelly, Elec Ry J 45:794-5 Ap 24 '15
San Francisco-Oakland terminal railways' way standards, G: H. Binkley, il Elec Ry J 46: 523-6 S 18 '15
Third rail and trolley system of the West Jersey and seashore railroad, J. V. B. Duer, il diags Am Inst E E Pro 34:1237-53 Je '15
Top contact unprotected conductor rail for 600 volt traction systems, C: H. Jones, il Am Inst E E Pro 34:1283-93 Je '15; Abstract, Elec Ry J 46:55-6 J1 10 '15
2400-volt railway of the Bethlehem-Chile iron mines company, E. E. Kimball, Gen Elec R 18:12-14 Ja '15
Vienna-Pressburg single-phase railway, E. E. Seefehlner, il Elec Ry J 45:828-31 My 1 '15
See also Electric railroads—Wiring; Poles, Concrete: Pailways.

See also Electric railroads—Wiring; Poles, Concrete; Railroads—Electrification

# Control

Equipment defects—control apparatus and connections. C: W. Squier. Elec Ry J 44: 1107-8, 1167-8, 1207-8, 1260-1, 1307, 1353-4, 1395-6 N 14-D 26 '14
Equipment defects—controller blow-out coils. C. W. Squier. diags Elec Ry J 45:591-2 Mr 20 '15

20 '15
Equipment defects—controller drums, shafts and handles. C. W. Squier. diags Elec Ry J 45:242-4 Ja 30 '15
Equipment defects—controller reverse drums and interlocking mechanism. C. W. Squier. diag Elec Ry J 45:382-3 F 20 '15
Equipment defects—hand-operated controllers—contacts, fingers, springs and bases. C. W. Squier. il diags Elec Ry J 45:102-3, 140-2 Ja 9.18 '15

Experiences with field control, H. M. Lloyd. Elec Ry J 46:191 Jl 31 '15

New cars of Seattle municipal railway, H. J. Kennedy, il diag Elec Ry J 44:1284-6 D 12 '14

New York municipal car—motors, control, conduit and collectors, il diags Elec Ry J 45: 496-503 Mr 13 '15

Relay setting to maintain uniform acceleration. P. V. See. Elec Ry J 45:761 Ap 17 '15

Resawing old controller segments to smaller size, F. A. Miller, il diags Elec Ry J 46: 236 Ag 7 '15

Sprague-General electric PC control. C. Axtell. il plan Gen Elec R 18:985-90 O '15

# Cost of construction

Conditions affecting the success of main line electrification. W. S. Murray. il Am Inst E E Pro 34:1873-99; Tables. 1906-8; Discus-sion. 1913-32 Ag '15

Contact system of the Bufte, Anaconda & Pacific railway. J. B. Cox. il diags map Am Inst E E Pro 34:1447-76 Ag '15; Same. Gen Elec R 18:842-59 Ag '15; Abstract. Elec Ry J 46:59-60 Jl 10 '15

Contact system of the Southern Pacific company Portland division. P. Lebenbaum. il diags map Am Inst E E Pro 34:1295-1308 Je '15; Abstract. Elec Ry J 46:57-8 Jl 10 '15

Overhead contact systems, construction and costs. E. J. Amberg. pls Am Inst E E Pro 34:1255-66 Je '15

# Cost of equipment

Equipment cost data. Elec Ry J 45:427 F 27

# Cost of maintenance and operation

Conditions affecting the success of main line electrification. W. S. Murray, il Am Inst E E Pro 34:1873-99; Tables, 1900-4, 1909-11; Discussion. 1913-32 Ag '15

Construction, maintenance and cost of over-head contact systems; catenary construc-tion. F. Zogbaum. Am Inst E E Pro 34:1267-81 Je '15

Electric railroads—Cost of maintenance—Cont.
Contact system of the Butte, Anaconda & Pacific railway. J. B. Cox. il diags map Am Inst E E Pro 34:1447-76 Ag '15; Same. Gen Elec R 18:842-59 Ag '15; Abstract. Elec Ry J 46:59-60 Jl 10 '15
Economies in operating small cars. J. F. Layng. Gen Elec R 18:700-5 Ag '15
Jitney problem; operating economies made possible by the use of light cars. J. C. Thirlwall. Gen Elec R 18:606-14 Jl '15
Maintenance costs on the New York Central. E. B. Katté. Elec Ry J 45:580-1 Mr 20 '15
Maintenance costs—reducing handling of equipment and departmental co-operation. H. A. Leonhauser. Elec Ry J 45:384-6 F 20

New Haven operating results. Elec Ry J 46: 101-2 J1 17 '15

New Haven operating results. W. S. Murray. Elec Ry J 45:229-31 Ja 30 '15

Operating costs and shifts in service. F. W. Dooittle. Elec Ry J 46:400 S 4 '15

Reducing the operating ratio. Elec Ry J 44: 1340 D 19 '14

St. Clair tunnel electrification operating data. Elec Ry J 46:1084-5 N 27 '15

Third rail and trolley system of the West Jersey and seashore railroad. J. V. B. Duer. il diags Am Inst E E Pro 34:1237-53 Je '15; Abstract. Elec Ry J 46:58-9 J1 10 '15

Highway-crossing protection; abstract of report of block signal committee of the Illinois electric railways association. il Elec Ry J 45:174-9 Ja 23 '15
Practical views of special work—the crossing.
R. P. Williams, diags Elec Ry J 46:678-80 O

Shockless railroad crossing, il diags Elec Ry J 45:994-6 My 22 '15

# Development work

Relation of railways to agriculture. P. Shoup. Elec Ry J 46:807-9 O 16 '15

### Employees

Employees

B. R. T. mechanical department. Elec Ry J
46:326-7 O 16 15
Chicago elevated first-aid system. H. E.
Fisher, il map Elec Ry J 46:430-4 S 11 15
Chicago elevated medical methods. H. E.
Fisher, il Elec Ry J 45:1192-5 Je 26 15
Employment bureau. H. G. Winsor. Elec Ry
J 46:9-10 Jl 3 15
Examining the physique of Chicago elevated employees. H. E. Fisher. il Elec Ry J 46:
216-19 Ag 7 15
Graded wage scale. W. J. Sherwood. Elec Ry
J 46:912 O 30 15
Human element in electric railway operation.
H. C. DeCamp. Elec Ry J 45:1157-8 Je 19 15
Instruction and handling of employees at Hampton, Va. il Elec Ry J 46:230-1 Ag 7 15
Joliet, Ill., arbitration decision rendered. Elec Ry J 46:1003 N 13 15
Maintaining proper relations between a railway and its car men. G. H. Harris. il Elec Ry J 46:531-2 S 18 15
Neglected principle of the safety first move-

Neglected principle of the safety first movement; proper selection of trainmen. C. J. Franklin. Elec Ry J 44:1244-6 D 5 '14

Results obtained by instruction department, New York state railways, Rochester lines. G: Lawson. Elec Ry J 45:367-9 F 20 '15

See also Street railroads-Employees

# Equipment and supplies

Change of trolley wheel design and trolley lubrication. W. P. Jackson, diags Elec Ry J 46:449 S 11 '15

Chemical department of the Illinois traction system. N. R. Beagle, Elec Ry J 45:423 F 27

Chemical engineering on the Bay State street railway. Elec Ry J 45:90-2 Ja 9 '15

Discussion on depreciation of equipment. Elec Ry J 44:1335-7 D 19 '14

Equipment defects—control apparatus and connections. C. W. Squier. Elec Ry J 44: 1107-8, 1167-8, 1207-8, 1260-1, 1307, 1353-4, 1395-6 N 14-D 26'14

Equipment defects—controller blow-out coils, C. W. Squier, diags Elec Ry J 45:591-2, 635-7, 677-8 Mr 20-Ap 3 '15 Equipment defects—controller drums, shafts and handles, C. W. Squier, diags Elec Ry J

Equipment defects—controller drums, shafts and handles. C. W. Squier. diags Elec Ry J 45:242-4 Ja 30 '15
Equipment defects—controller reverse drums and interlocking mechanism. C. W. Squier. diag Elec Ry J 45:382-3 F 20 '15
Equipment defects—hand-operated controllers—contacts, fingers, springs and bases. C. W. Squier. il diags Elec Ry J 45:102-3, 140-2 Ja 9-16 '15
Exhibits at Panama-Pacific exposition. Elec

Ja 9-16 '15
Exhibits at Panama-Pacific exposition. Elec Ry J 45:519-20 Mr 13 '15
Experience with malleable iron cross-arms on wooden poles. diags Elec Ry J 45:297 F 6 '15
Flexible running track scraper. it Elec Ry J 46:961 N 6 '15
Handling and sale of car wheels, rails and scrap iron. J. P. Alexander. Elec Ry J 45: 245-6 Ja 30 '15
Harps and wheels of high current-carrying capacity. it Elec Ry J 46:920 O 30 '15
High-voltage direct-current railway equipments. Elec Ry J 45:13 Ja 2 '15
Latest developments in railway equipment. W. R. Stinemetz. Elec Ry J 44:1296-7 D 12 '14

14

Memphis maintenance co-operation. Elec Ry J

"14

Modern crane trolley. il Elec Ry J 45:721-2 Ap 10 15

Modern crane trolley. il Elec Ry J 44:1400 D 26 '14: Ry Age (Mech ed) 89:97-8 F '15

New trolley base and headlight. il Elec Ry J 45:1082 Je 5 '15

New type of catenary hanger. W. H. Creviston. il Elec Ry J 46:154 Jl 24 '15

Non-arcing harp and oil-less bushing. il Elec Ry J 45:474 Mr 6 '15

Portable car testing set. D. D. Ewing. plan Elec Ry J 46:152 Jl 24 '15

Portable lamp bank for equipment tests. F. L. Hinman. il Elec Ry J 45:513 Mr 13 '15

Power reel for cars, trucks, etc. R. H. Parsons. diags Elec Ry J 45:894-5 My 8 '15

Railway equipment for 5,000 volts direct current. C. Renshaw. il diags Elec R & W Elec'n 67:774-7 O 23 '15

Rallway sand experience. W. F. Carr. Elec Ry J 45:113 Ja 16 '15

Recorder for passenger-mile earnings. il Elec Ry J 45:948-9 My 15 '15

Report of the Engineering association committee on equipment. Elec Ry J 46:749-50 C 9 '15

Roller-bearing trolley wheels. il Elec Ry J

mittee on equipment. Elec Ry J 46:749-50 C 9 '15 Roller-bearing trolley wheels. il Elec Ry J 45:996-7 My 22 '15 Sale of scrap metals. B. J. Yungbluth. Elec Ry J 45:981 F 20 '15 Sales of scrap metals. J. P. Alexander. Elec Ry J 45:192-3 Ja 23 '15 Selection of railway equipment. J. F. Layng Gen Elec R 18:126-31 F '15 Single-circuit metal-arm construction. il Elec Ry J 46:774 O 9 '15 Sioux City's self-lubricating trolley stand C. M. Feist. diag Elec Ry J 46:365 Ag 28 '15 Sleeving shrunk on worn armature shafts-rethreading pinion-end threads. diag Elec Ry J 45:720-1 Ap 10 '15 Split self-lubricating trolley harp. C. M. Feist il Elec Ry J 46:409 S 4 '15 Straight-line hanger that stays on. il Elec R: J 46:880 O 23 '15 Tri-city railway bearing practice. J: Suther land. il Elec Ry J 45:944-5 My 15 '15 Trolley wheels of 10-in. diameter. F. A. Miller il Elec Ry J 46:278-9 Ag 14 '15 Trolley wire and pantograph shoe wear of Apparelle shart line. D. E. Creuse il Elec.

rolley wire and pantograph shoe wear of Annapolis short line. D. E. Crouse. il Ele Ry J 46:638-9 S 25 '15

Wheel press for pressing pantograph shoe and testing springs and hose. R. R. Potter il Elec Ry J 44:1257-8 D 5 '14

Where classifying scrap paid; Fort Wayne Northern Indiana traction co.'s tests, A. Redderson. Elec Ry J 46:957-8 N 6 '15

See also Electric motors, Railway; Electri railroads—Cost of equipment

### Fares

Another Massachusetts fare increase; 6-cen fare to the Norfolk & Bristol street railway map Elec Ry J 46:354-5 Ag 28 '15

Electric railroads—Fares—Continued
Bay State opens fare case, Elec Ry J 46:1006—
7 N 13 '15

Copper zones for Shore line electric railway. Elec Ry J 46:443-5 S 11 '15

New Bedford & Onset fare hearing. Elec Ry J 45:959 My 15 '15

Six-cent fare granted to the New Bedford & Onset street railway, map Elec Ry J 46: 628-31 S 25 '15

#### Finance

Electric railway earnings. Elec Ry J 46:106 Jl

Electric railway statistics. Elec Ry J 45:183-5 Ja 23 '15

Electric rahway statistics.

Ja 23 '15

Northern electric plan completed. Elec Ry J
46:886 O 23 '15

Receiverships and foreclosure sales in 1914.

Elec Ry J 45:19 Ja 2 '15

See also Electric railroads—Accounting;
also New York railways

#### Freight

Freight

Businesslike methods in handling freight by electric railroads, J. McMillan, il Elec Ry J 46:482-7 S 18 '15

Car-load freight on small lines, J. S. Clark, Elec Ry J 45:1114 Je 12 '15

Electric freight service at Bangor, il Elec Ry J 44:1328-30 D 19 '14

Electric railway freight in Maine, C. H. Nottage, il Elec Ry J 45:1213-14 Je 26 '15

Locomotive and trail cars in Detroit United freight service, C. L. Keller, il Elec Ry J 45:848-9 My 1 '15

Package freight on interurban cars, J. F. Strattan, Elec Ry J 46:1078-9 N 27 '15

Rapid handling of auto bodies on the Detroit United railway, N. Rumney, il Elec Ry J 44: 1333 D 19 '14

Report of the A. E. R. A. committee on express and freight traffic, Elec Ry J 46:762-4

O 9 '15

# Law

Electric railway legal decisions. Elec Ry J 46: 196-8 Jl 31 '15

#### Maintenance and repair

Maintenance and repair

Car maintenance on a definite cost basis. K. C. Schluss. Elec Ry J 46:568-9 S 18 '15

Charges for repairs to foreign equipment. Elec Ry J 46:1079-80 N 27 '15

Chicago elevated shop practice. il diags Elec Ry J 45:551-5 Mr 20 '15

Deferred maintenance. C. H. Fuller. Elec Ry J 45:791-3 Ap 24 '15

Departmental work planning system at Portland, Ore. F. P. Maize. il Elec Ry J 46:565-7 S 18 '15

Erom a.c. to d.c. in the night il diags Flock

From a.c. to d.c. in the night, il diags Elec Ry J 45:542-50 Mr 20 '15

Ry J 45:542-50 Mr 20' 15

Graphics in maintenance work. Elec Ry J 46:947-51 N 6' 15

Maintenance of a 1200-volt catenary on Southern Pacific lines. J. B. Nichols. il Elec Ry J 46:942-3 S 18' 15

Maintenance of 1500-volt d. c. cars by the Southern Pacific company. E. Sears. il Elec Ry J 46:551-4 S 18' 15

Maintenance of 1200-volt d. c. cars by the Southern Pacific company. R. E. Hewitt. il Elec Ry J 46:546-8 S 18' 15

Maintenance of 1200-volt d. c. cars by the Oregon electric railway. D. I. Clough. il Elec Ry J 46:555-6 S 18' 15

Memphis maintenance co-operation. Elec Ry J 45:721-2 Ap 10' 15

Signal maintenance methods on the New York, Westchester & Boston Ry. il Elec Ry J 45:

Westchester & Boston Ry. il Elec Ry J 45: 561-5 Mr 20 '15

561-5 Mr 20 '15
Signal maintenance on the 1200-volt Oregon electric railway. E. R. Cunningham. il Elec Ry J 46:557-8 S 18 '15
Way department rule book to promote standard practice. Elec Ry J 45:89 Ja 9 '15
Way records on cost per section basis. F. W. Hulett. Elec Ry J 45:69-71 Ap 3 '15
What constitutes good and sufficient maintenance? J. P. Barnes. Elec Ry J 45:467
Mr 6 '15 tenance? Mr 6 '15

See also Cars—Repair; Electric railroads—Cost of maintenance; Electric railroads—Equipment and supplies; Electric railroads— Shops

#### Management

Bay State way organization. Elec Ry J 46:229

Bay State way organization. Ag 7 '15
Car maintenance on the San Francisco-Oakland terminal railways. G: St. Pierre, il diags Elec Ry J 46:527-30 S 18 '15
Graphs, charts and statistics as aids to administration. E. C. Stothart. Elec Ry J 46: 665-7 O 2 '15
How Bay State railway maintains 2751 vehicles with 680 men. Elec Ry J 46:671-2 O 2 '15

ancaster's experience with time-inspection system. R. B. Hull. Elec Ry J 46:1034-5 N 20 '15

Maintenance costs—reducing handling of equipment and departmental co-operation. H. A. Leonhauser. Elec Ry J 45:384-6 F 20 '15

Methods of increasing revenue. G. K. Jeffries. Elec Ry J 46:1039 N 20 '15 99.2 per cent of Westchester trains are on time. Elec Ry J 46:190 Jl 31 '15 One-man car. J. M. Bosenbury. Elec Ry J 45: 627 Mr 27 '15 trains are on

627 Mr Power st 921 MT 24 15 Power station organization on Bay State street railway. Elec Ry J 46:911 O 30 '15 Watch standards. A. J. Boardman. Elec Ry J 46:874-5 O 23 '15

See also Electric railroads-Coasting; Electric railroads—Medical departments; Electric railroads—Records; Street railroads— Management

# Medical departments

Chicago elevated medical methods. H. E. Fisher. il map Elec Ry J 45:1192-5; 46:216-19, 430-4 Je 26, Ag 7, S 11 '15

Ampere-hour meters on the Annapolis short line. Elec Ry J 45:722-3 Ap 10 '15 Meter results on Chicago & Milwaukee line. il diag Elec Ry J 45:973-6 My 22 '15 Saving power by watt-meter records. Elec Ry J 46:822-3 O 16 '15

See also Electric railroads-Coasting

Power

Direct-current 5,000-volt railway operation.
diag Power 42:652 N 9 '15

Economies in electric railway power equipment. Elec R & W Elec'n 66:216 Ja 30 '15

Economies in operating small cars. J. F.
Layng. Elec Ry J 45:793-80 My 22 '15

Economies in power consumption in electric railways. N. W. Storer, W Soc E J 20:205-22

Mr '15; Same cond. (Saving energy in car propulsion.) Elec Ry J 45:286-9 F 6 '15;
Discussion. W Soc E J 20:223-31 Mr '15

First 5000-volt d, c. railway. J; G. Pertsch.
Sibley J 30:72 N '15

5000-volt direct-current railway, diags map Engineer 120:440-1 N 5 '15

5000-volt experimental line of the Michigan United traction company. C. Renshaw. il diags map Ry B 57:533-6 O 23 '15

Inertia effect of moving electric trains.
J, McAnnix. Elec Ry J 45:714-15 Ap 10 '15

New York Interborough power plant enlargement. il diags Elec Ry J 45:744-9 Ap 17 '15;
Same. Elec W 65:975-9 Ap 17 '15

Operating with 5000-volt direct current. N. W. Storer, il diag map Elec Ry J 46:660-3 O 2 '15

Power consumption of railway motors. H. L. Andrews and L. C. Thisland in Care.

Power consumption of railway motors, H. L. Andrews and J. C. Thirlwall, il Gen Elec R 18:944-51 O '15

Power dispatching. G. L. Fitch. Elec Ry J 45:470-1 Mr 6 15

Power distribution on Penn. R. R. at Philadelphia. il plan Power 42:685-6 N 16 '15

Power economy expert obtains results for the elevated railroads of Chicago. Elec Ry J 46: 391 S 4 '15

Power supply of the public service railway. Elec Ry J 45:1022-3 My 29 '15

Promoting service. J: G. Montgomery. Elec R & W Elec'n 66:169 Ja 23 '15

Railway power rates in Chicago. Elec Ry J 46z 138 Jl 24 '15

Electric railroads—Power—Continued

Regenerating electric ore railroad. Eng M 49: 121-2 Ap '15
Relation between car operation and power consumption. J. F. Layng. Gen Elec R 18:

consumption. J. F. Layng. Gen Elec R 18: 973-6 O '15
Resale of energy by customer to second central station. Elec W 66:704-5 S 25 '15
Small car versus the large car. D. C. Hershberger. Elec Ry J 46:394-5 S 4 '15
Storage batteries for handling peak loads. E. Brown. Power 41:470-1 Ap 6 '15
System of the Columbus railway and light co. il Power 42:339-41 S 7 '15

See also Electric plants—Central stations; Electric railroads—Coasting; Electric railroads—Meters; Electric railroads—Substa-

#### Public relations

Code of principles. O. T. Crosby, Elec Ry J 45:370-3 F 20 '15

45:370-3 F 20 '15
Code of principles. T. S. Williams. Elec Ry J 45:220-2; Discussion. G. E. Tripp; M. C. Brush. 45:214-16 Ja 30 '15
Code of principles and publicity. C. L. S. Tingley. Elec Ry J 44:1345-6 D 19 '14
Electric railways and the public. E. R. Johnson. Elec Ry J 44:1297-8 D 12 '14
How a railway helps the farmer to produce bigger and better crops. H. A. Hinshaw. Elec Ry J 46:559 S 18 '15
Poisonipt the wells: objection to the Code of

Ry J 46:559 S 18 '15 Poisoning the wells: objection to the Code of principles by the "New republic." Elec Ry J 44:1230 D 5 '14 Relation of railways to agriculture. P. Shoup. Elec Ry J 46:807-9 C 16 '15 Utilizing the county fair in publicity work. W. H. Boyce, il Elec Ry J 46:945-6 N 6 '15

See also Electric railroads and state

#### Records

Car record and trouble board combined. Elec Ry J 46:878 () 23:215
Card records of Los Angeles track work. G. E. Campbell. Elec Ry J 46:407-8 S 4 '15
Coasting; Denver tramway gave experience with coasting clocks, showing resulting energy economy. H. P. Fligg. Elec Ry J 45: 705-6 Ap 10'15

Coasting; Denver tramway gave experience with coasting clocks, showing resulting energy economy. H. P. Fligg. Elec Ry J 45: 705-6 Ap 10 '15
Coasting recorders in New York. il Elec Ry J 45:572-5 Mr 20 '15
Coasting records of Northern Texas traction company. il Elec Ry J 45:1198-1200 Je 26 '15
Daily work-train report. T; W. Blinn. Elec Ry J 46:36 S 25 '15
Following up watt-hour meter records at El Paso. il Elec Ry J 46:12-13 Jl 3 '15
Graphics in maintenance work. Elec Ry J 46: 947-51 N 6 '15
Indexing car equipment data. H. S. Cooper. Elec Ry J 46:1040-1 N 20 '15
Indexing car equipment data. N. Litchfield. Elec Ry J 46:677-8 O 2 '15
Meter results on Chicago & Milwaukee line. il diag Elec Ry J 45:973-6 My 22 '15
Meters and men. C. H. Koehler. Elec Ry J 45:633 Mr 27 '15
Reduction in power cost effected by the use of coasting recorders. W. R. Alberger. Elec Ry J 46:520-1 S 18 '15
Scientific coasting at Oakland. il Elec Ry J 46:528-71 Ag 14 '15
Use of coasting recorders results in economies at Vancouver. W. G. Murrin. il Elec Ry J 46:573-4 S 18 '15
Way department report forms. Elec Ry J 46: 396-9 S 4 '15

\*\*Wester Scientific Coasting Recorders Results in economies at Vancouver. W. G. Murrin. il Elec Ry J 46:573-4 S 18 '15
\*\*Way department report forms. Elec Ry J 46: 396-9 S 4 '15
\*\*Way department report forms. Elec Ry J 46: 396-9 S 4 '15

See also Electric railroads-Meters

# Rolling stock

All-steel passenger cars for the Pacific electric railway. F. F. Small. il diags Elec Ry J 46: 489-92 S 18 '15

489-92 S 18 '15
Car design from a service standpoint, il diags
Elec Ry J 46:578-80 S 18 '15
Electric rolling stock ordered in 1914: a tabulation showing the number, type, carbody length and character of construction. Elec
Ry J 45:16-18 Ja 2 '15

See also Cars; Street cars

#### Runaway cars

Effective stop for runaway cars, il diag Elec Ry J 45:706-7 Ap 10 '15

# Safety devices and measures

Block to protect switch blades of type K controllers, R. H. Parsons, diags Elec Ry J 45:386 F 20 '15
Brady medal award, Elec Ry J 45:281-2 F 3

Change in car-wiring code recommended. Elec Ry J 45:285 F 6 '15 Effective stop for runaway cars, il diag Elec Ry J 45:706-7 Ap 10 '15 Effects of remote feeder taps on schedule speed. N: Stahl. Elec Ry J 45:991-2 My 22 '15

Feeder-tap protection for d.c. apparatus and a few suggestions regarding the care of commutators. C: H. Smith. Elec Ry J 45: 627-8 Mr 27 '15
Reducing accidents in the Milwaukee shops. il Elec Ry J 45:756 Ap 17 '15
Report of the committee of A. E. R. A. on lightning protection. Elec Ry J 46:746-7 O 9 '15

Results of safety work, F. K. George, Elec Ry J 45:794 Ap 24 '15 Safety first movement, il Elec Ry J 45:34-46 Ja 2 '15

& Peoria railway. W. F. Carr. Elec Ry J 44:1251 D 5 '14

Safety-first organization chart. Elec Ry J 46: 448 S 11 '15 Safety of trains on the Chicago elevated. il Elec Ry J 46:302-5 Ag 21 '15

See also Electric railroads—Signals; Street railroads—Safety devices and measures; Subways—Safety devices and measures

# Shops

Shops
Chicago elevated shop practice. il diags Elec Ry J 45:551-5 Mr 20 '15
Cleveland builds four operating stations. il plans Elec Ry J 46:366-61 Ag 28 '15
Cleveland railway occupies new repair shops. il diags plan Elec Ry J 46:1022-30 N 20 '15
Cleveland railway's new repair shops. il plans Elec Ry J 45:108-72 Ja 23 '1.
Design, construction and detailed labor costs of car shops for Omaha & Council Bluffs street railway co., Omaha, Neb, W. L. Fulton. diag plans Eng & Contr 44:264-6 O 6 '15
Mesabi railway's new repair shops and office building. G. Sargl. plans Elec Ry J 46:312-13
Ag 21 '15
Monroe (Tex), maintenance shops, il plan Elec

Ag 21 '15

Monroe (Tex). maintenance shops, il plan Elec Ry J 46:176-8 Jl 31 '15

New carhouse and shops at Holyoke, il plan Elec Ry J 45:930-1 My 15 '15

Norfolk & Western electrification, map Elec Ry J 45:1069 Je 5 '15

Oil bath tank, R. H. Parsons, diags Elec Ry J 45:65 Ja 2 '15

Reducing accidents in the Milwaukee shops, il Elec Ry J 45:756 Ap 17 '15

Repair-shop procedure at Milwaukee, il Elec Ry J 45:786-90 Ap 24 '15

Shop kinks at Holyoke, il Elec Ry J 45:899

My 8 '15

My 8 '15

Shop notes from Hampton, Va. il Elec Ry J 46:50-2 Jl 10 '15 Special work shop for electric railways. S. Gausmann. plan Elec Ry J 45:992-3 My 22

Springfield shops and carhouse, il plans Elec Ry J 45:556-60 Mr 20 '15 Tri-city railway trouble board. J: Sutherland, il Elec Ry J 45:1078 Je 5 '15

# Signals

Signals
Automatic block signals on an interurban railway, il diag Eng N 74:150-1 Jl 22'15
Automatic signals on Norfolk & Western electrified line, il Ry Age 59:21-2 Jl 2'15
Highway-crossing protection; abstract of report of block signal committee of the Illinois electric railways association, il Elec Ry J 45:174-9 Ja 23'15
Highway crossing signal with indicators, il Elec Ry J 46:1046-7 N 20'15
Highway-crossing protection by trolley contact control, il Elec Ry J 44:1357 D 19'14
Illinois traction system signaling, J: Leisen-

Illinois traction

linois traction system signaling. J: Leisenring. il plan Elec Ry J 45:408-10 F 27 '15

Interlocking installation on Pacific electric. il Elec Ry J 45:946-7 My 15 '15

Electric railroads-Signals-Continued

Joint report on block signals for electric railways. Elec Ry J 46:760-1 O 9 '15
Lamp signals for day service on electric railways. il Eng N 72:1250-1 D 24 '14
List of signals installed by electric railways during 1914. Elec Ry J 45:18 Ja 2 '15
Original application of signals for city service, diag Elec Ry J 45:1127 Je 12 '15
Railway signal association winter meeting. Elec Ry J 45:582-3 Mr 20 '15.
Signal, bonding and contact rail notes on the Northwestern Pacific. F. T. Vanatta. il Elec Ry J 46:539-40 S 18 '15
Signal maintenance methods on the New York, Westchester & Boston Ry. il Elec Ry J 45: 561-5 Mr 20 '15
Signal maintenance on the 1200-volt Oregon electric railway. E. R. Cunningham. il Elec Ry J 46:537-8 S 18 '15
Signal operation on the Oakland, Antioch & Eastern railway. F. A. Miller. il Elec Ry J 46:536-8 S 18 '15
Signals for new Brooklyn subways. Ry Age 57: 1191 D 25 '14
Special application of car-spacing signals. A. P. Way. il Elec Ry J 46:368-9 Ag 28 '15
Special application for car-spacing signals. A. P. Way. il Elec Ry J 46:368-9 Ag 28 '15
Special application of car-spacing signals. A. P. Way. il Elec Ry J 44:354-5 D 19 '14
Traffic control at electric railway crossings. il Munic Eng 48:178-80 Mr '15
Snow protection and removal

# Snow protection and removal

Removing snow from under-running third-rail. F. L. Hinman. diags Elec Ry J 45: 469 Mr 6 '15

#### **Statistics**

Census report on electric railways. Elec Ry J 45:96-7, 130-2 Ja 9-16 '15
Electric railway statistics. Elec Ry J 45:506-7 Mr 13 '15
Graphs, charts and statistics as aids to administration. E. C. Stothart. Elec Ry J 46: 665-7 O 2 '15

# Substations

Automatic railway substations. C. M. Davis. Elec Ry J 46:871 O 23 '15
Automatic railway substations. C. M. Davis. Gen Elec R 18:976-8 O '15; Excerpt. Elec Ry J 46:772-3 O 9 '15

J 46:772-3 O 9 '15 Automatic substations, E: Taylor, Elec Ry J 46:1075-6 N 27 '15 Automatically controlled substations with par-ticular reference to their application to in-terurban electric railways, E. W. Allen and E: Taylor, il plan Am Inst E E Pro 34:2159-73 S '15; Abstract, Elec Ry J 46:583-6 S 18 '15

Economics of electric railway distribution.
H. F. Parshall. Elec Ry J 44:1250 D 5 '14;
Same (Substation standardization). Elec R
& W Elec'n 65:1147 D 12 '14
High-voltage direct-current substation machinery. E. S. Johnson. Gen Elec R 18:641-3

Jl '15
Operation of a 1200-volt direct-current distribution system. J. Johansen. il Elec Ry J 46:549-50 S 18 '15
Pennsylvania electrification at Philadelphia. il plan Elec W 66:1074-6 N 13 '15
Portable substation at Pittsburgh. il Elec Ry J 45:1039-40 My 29 '15
Rating of railway substation machinery. W: L. Del Mar. Elec Ry J 46:21 Jl 3 '15
Semi-outdoor portable substation for the Berkshire street railway. il Elec R & W Elec'n 66:92-4 Ja 9 '15; Elec Ry J 45:56 Ja 2 '15; Eng N 72:1198 D 17 '14
Semi-outdoor portable substation for the Berksemi-outdoor portab

Eng N 72:1198 D 17 '14 Semi-outdoor portable substation for the Berk-shire street railway. W. D. Bearce. il Gen Elec R 18:44-7 Ja '15 Substation spacing in a. c. and d. c. systems. W: S. Murray. Elec Ry J 44:1345 D 19 '14

# Switches, frogs, etc.

Practical views of special work—the tongue switch, R. P. Williams; diags Elec Ry J 46:639-41 S 25 '15

# Taxation

Report of the committee of A. E. R. A. on taxation, Elec Ry J 46:733-5 O 9 '15

# Terminology

Contact system nomenclature, E. H. McHenry, Elec Ry J 46:275 Ag 14 '15 New technical terms in heavy electric trac-tion. Elec Ry J 46:214-15 Ag 7 '15

#### Track

Track

Corrugation of rails in electric railway service. Ry Age 58:1449 Je 18 '15

Rail-laying outfit on the Kankakee & Urbana traction line. T. W. Shelton. il Elec Ry J 45:242 Ja 30 '15

Signal, bonding and contact rail notes on the Northwestern Pacific. F. T. Vanatta. il Elec Ry J 46:539-41 S 18 '15

Steel tie construction in electrically-warmed concrete. J. M. Bamberger. il diag Elec Ry J 45:189-90 Ja 23 '15

Tests show satisfactory return-circuit conditions in Providence, R. I. Elec Ry J 46:825-6 O 16 '15

Track joining and bonding, E. C. Price, Elec

Track joining and bonding. E. C. Price. Elec Ry J 45:1156-7 Je 19 '15 See also Electric railroads—Switches,

frogs, etc.; Street railroads-Track

#### Valuation

Foundation principles of valuation. B. J. Arnold. Elec Ry J 46:713-19, 803-6 O 9-16 '15; Discussion. 46:732-3 O 9 '15

See also Public service corporations—Valuation; Street railroads—Valuation

# Wiring

Change in car-wiring code recommended.
Elec Ry J 45:285 F 6 '15 contact conductors and collectors for electric railways. C. J. Hixson. il diags Am Inst E E Pro 34:1477-90 Ag '15; Abstract. Elec Ry J 46:60-1 Jl 10 '15 Effects of remote feeder taps on schedule speed. N: Stahl. Elec Ry J 45:991-2 My 22 '15

Feeder-tap protection for d.c. apparatus and a few suggestions regarding the care of com-mutators. C: H. Smith. Elec Ry J 45:627-8 Mr 27 '15

Location of trolley wire on curves. S. L. Foster. diags Elec Ry J 45:62-4, 105, 142-3, 191, 244 Ja 2-30 '15

Sectionalizing of electric railway feeders at San Diego. H. MacNutt. plan Elec Ry J 46:496-9 S 18 '15 Trolley wire on double-leaf bascule bridge. S. L. Foster. diags Elec Ry J 46:1042-4 N 20 '15

Trolley wires on curves, plan Colliery 36:33 Ag '15 Unusual feed-in clamp, S. L. Foster, diags Elec Ry J 46:322 Ag 21 '15

#### Alsace

Features of electric railway in Alsace. Elec Ry J 46:1091 N 27 '15

#### Austria

Vienna-Pressburg single-phase railway, E. Seefehlner, il Elec Ry J 45:828-31 My 1 '15

# California

Building up local pleasure travel to points in the East Bay cities, J. H. Brown, il Elec Ry J 46:533-5 S 18 '15

lectric railway paradise. P. Shoup. il map Elec Ry J 46:475-80 S 18 '15 Electric

15-cycle single phase railway in California. il Engineer 120:2-3 Jl 2 '15

Handling traffic to the Panama-California exposition at San Diego. B. M. Warner. il Elec Ry J 46:508-9 S 18 '15

Notes on Southern Pacific electric service in the Bay cities, J. C. McPherson, il Elec Ry J 46:544-5 S 18 '15

Operation of the Pacific electric railway. il map Ry Age 59:225-9 Ag 6 '15

### Canada

1500-volt direct-current electrification of the Ontario municipal railway. G. H. Hill. Gen Elec R 18:10-11 Ja '15 Hamilton electric incline railway. il Elec Ry J 46:115-16 Jl 17 '15

# Electric railroads -Continued

#### Connecticut

Connecticut commission report. Elec Ry J 44: 1401-2 D 26 '14

#### Germany

German 1500-volt d.c. line with regeneration and battery. Elec Ry J 45:274 F 6 '15

#### Great Britain

British managers discuss conditions. Elec Ry J 46:224 Ag 7 '15 46:224 Ag 7 '15 C. C. tramways. Engineer 120:106-7 Jl 30

L.,15

Tranways in the United Kingdom; operating results for the year 1912-1913. A. J. Lawson. Elec Ry J 45:929 My 15 '15
Working of tramways in the United Kingdom. A. J. Lawson. Engineer 118:577-8, 600-1 D 18-25 '14

### Idaho

1500-volt interstate interurban railway. il map Elec Ry J 46:1073-4 N 27 '15

# Indiana

Address. T: Duncan. Elec Ry J 45:456-8 Mr

Electric railway taxation in Indiana. Elec Ry J 45:53 Ja 2 '15

# Maine

Portland & Lewiston interurban, il map Elec Ry J 46:618-21 S 25 '15

#### Spain

Electric traction in Spain. W. Reinhart. Elec W 66:350 Ag 14 '15

### Switzerland

Looping the loop in the Alps. J. F. Springer. il Sci Am 111:504-5 D 19'14

# United States

Development of the electric railway. J. H. Mc-Graw. Elec Ry J 46:723-4 O 9 '15

Electric railway track built in 1914. Elec Ry J 45:14-15 Ja 2 '15

Year in the electrical industry, Elec R & W Elec'n 66:8 Ja 2 '15

1500-volt interstate interurban railway. il map Elec Ry J 46:1073-4 N 27 '15

Salt Lake & Utah railroad, il map Elec Ry J 45:54-5 Ja 2 '15

# Virginia

Traffic notes from Hampton, Va. il Elec Ry J 46:317-18 Ag 21 '15

# Electric railroads and state

T: Duncan, Elec Ry J 45:456-8 Mr

Argument on authority of Interstate commerce commission to require reports of accidents and other statistics from urban railways. J. T. Beasley. Elec Ry J 44:1389-90 D 26 '14 Code of principles. O. T. Crosby, Elec Ry J 45:370-3 F 20 '15

ctric railway association, American. American electric railway association Electric

Electric railway association, Central. See Central electric railway association

Electric railway journal Results of a straw ballot of readers' preferences. Elec Ry J 45:52-3 Ja 2 '15

Electric railway mall service Compensation for carrying United States mail; A. E. R. A. committee report. Elec Ry J 46:727-8 O 9 '15

Electric railway mail statistics from report of second assistant postmaster general for year ended June 30, 1914. Elec Ry J 44:1387 D 26 '14

# Electric rates. See Electric power-Rates

Electric resistance Adjustments of the Thomson bridge in the measurement of very low resistances. F. Wenner and E. Weibel. U S Bur Stand Bul 11:65-8 N 15 '14 Calibration of current transformers by means of mutual inductance. C: Fortescue. diags pls Am Inst E E Pro 34:1199-1215 Je '15 Carbon as a heating element in appliances. C. W. Piper. Elec W 66:134-5 Jl 17 '15 Comparisons of electric resistivities at high temperatures. C. Hering. Met & Chem Eng 13:23-8 Ja '15 Court of appeals decision in nickel-chromium resistor suit. Met & Chem Eng 13:414-15 Jl '15

resistor suit. Met & Chem Eng 13:414-15 Ji
Distortion of alternating current wave caused
by cyclic variation in resistance. F: Bedell
and E. C. Mayer. diags Am Inst E E Pro
34:177-86 F '15; Discussion. 34:2584-9 O '15
Effective resistance and inductance of from
and bimetallic wires. J: M. Miller. diags
U S Bur Stand Bul 12:207-67 N 8 '15
Electrical resistance and critical ranges of
pure iron. G. K. Burgess and I. N. Kellberg.
U S Bur Stand Bul 11:457-70 My 10 '15
Experimental researches on skin effect in conductors. A. E. Kennelly, F. A. Laws and
P. H. Pierce. bibliog il diags Am Inst E E
Pro 34:1749-1814 Ag '15
Insulating properties of solid dielectrics. H. L.
Curtis. diags U S Bur Stand Bul 11:359-420
My 10 '15; Excerpt (Volume resistivity table)
Elec R & W Elec'n 66:171 Ja 23 '15
Method for measuring earth resistivity. F.
Wenner. J Fr Inst 180:373-5 S '15; Same.
Elec R & W Elec'n 67:980 N 27 '15
Methods of measuring the inductances of low-

Methods of measuring the inductances of low-resistance standards. F. Wenner, E. Weibel and F. B. Silsbee, diags U S Bur Stand Bul 12:11-21 O 28 15

12:11-21 O 28 '15
Proper construction of earth connections,
G. H. Rettew. Gen Elec R 18:904-7 S '15;
Abstract. Engineer 120:462 N 12 '15
Receiving-end impedance of a conducting line
loaded at both ends. A. E. Kennelly. Elec
W 66:182-4 Jl 24 '15
Skip affect in himetallic wires. J: M. Miller.

W 66:182-4 Jl 24 '15
Skin effect in bimetallic wires. J: M. Miller.
Elec W 65:1612-13 Je 19 '15
Temperature coefficient formulae for copper.
J: D. Ball. Gen Elec R 18:669 Jl '15
Volume resistivity and surface resistivity of insulating materials. H. L. Curtis. diag Gen Elec R 18:996-1001 O '15
Wheatstone bridge for resistance thermometry. C. W. Waidner and others. il diags U S
Bur Stand Bul 11:571-90 My 27 '15

See also Electric conductivity; Electric measurement; Electric testing; Insulation; Electric

# Electric service, Rural

nectric service, Rural

Analysis of central-station practice in Wisconsin regarding rural service. Elec R & W Elec'n 66:237-9 F 6 '15

Economics of the rural-customer problem. il Elec W 65:176 Ja 16 '15

Meter practice on rural electric-service lines. il Elec W 64:1110 D 5 '14

# Electric service companies

Advancing the commercial purpose. Elec W 65:1640 Je 19 '15
Business hints for dealer and contractor. G. D. Crain, jr. Elec R & W Elec'n 66:1059-60 Je

Ciam, jr. Elec R & W Elec R 65:1093-60 Je 5 '15
Central-station business improves; statistics. Elec W 65:81-3 Ap 17 '15
Central-station development of Portland, Maine. il map Elec W 65:519-22 F 27 '15
Central-station returns for October. Elec W 65:92-3 Ja 9 '15
Colorado electric light, power and railway association 13th annual convention. Elec W 66:792-3 O 9 '15
Commercial practices in California. H. B. Pitts. il Elec W 65:1409-12 My 29 '15
Demonstration of a power sale; abstract. C. H. Stevens. Elec W 65:1525-6 Je 12 '15
Electric developments on the Pacific coast. il Elec W 65:1387-98 My 29 '15
How the use of appliances increases the residence non-lighting load. Elec W 66:980 O 30 '15
Irrigating the land of little rain. S. M. Ken-

Irrigating the land of little rain. S. M. Kennedy. il diags Elec W 65:1471-4 Je 5 '15

Irrigation in the Wenatchee valley. A. Gunn. il Elec W 65:1560-3 Je 12 '15

Irrigation pumping in the coast states, il map Elec W 65:1399-1408 My 29 '15

Electric service companies—Continued

Middle west utilities: companies register a 7.8
per cent growth in income and a 9.5 per cent
growth in output. Elec W 64:1174 D 12 '14
N. E. L. A. New England section 7th annual
convention. Elec R & W Elec'n 67:577-83 S

Northwest electric light and power association 8th annual convention, Portland, Ore. Elec R & W Elec'n 67:528-34 S 18 '15
Northwest electric light and power association's 8th annual convention, Portland, Ore. Elec W 66:567-9 S 11 '15
Ohio central-station men meet in Cleveland. Elec R & W Elec'n 66:192-3 Ja 30 '15
Ohio electric light association convention at Cedar Point. Elec W 66:219-20 Jl 24 '15
Ohio new-business men hold profitable convention. Elec R & W Elec'n 67:967-8 N 27 '15
Pacific gas & electric company. Elec W 65: 1669-70 Je 26 '15
Pennsylvania electric association 8th annual convention. Elec R & W Elec'n 67:524-8 S 18 '15

Pennsylvania electric association 8th annual convention. Elec W 66:661-2 S 18 '15 Relations between contractor and central station; abstract. A. E. Loeb. Elec W 66:662 S 18 '15

S 18 '15
Small consumer—a problem. A. D. Dudley.
Gen Elee R 18:657-8 J1 '15; Abstract and discussion. Elec W 65:1324-5 My 22 '15
Stability in the central-station industry. F:
Nicholas. Elec W 66:572-4 S 11 '15
Successful meeting of Ohio new-business men.
Elec R & W Elec'n 66:580-1 Mr 27 '15
Why central stations do not get all the big power business; symposium. Elec W 66:759-60 O 2 '15
Year of sales at Providence, R. I. il Elec W 65:1311-15 My 22 '15
See also. Electric plants—Central stations:

See also Electric plants—Central stations; lectric service, Rural; Electric vehicles and Electric service, the central station

# Accounting

Accounting

Accounting methods; discussed by N. E. L. A. Elec W 65:1531-2 Je 12 '15

Billing and collecting systems of small companies. Elec R & W Elec'n 67:184-6 Jl 31 '15

Electric consumer's ledger sheets. Elec W 65: 304 Ja 30 '15

Electric light and power accounting. O. A. Small. Elec Ry J 45:1113 Je 12 '15

N. E. L. A. accounting section. H. M. Edwards. Elec W 65:498-9 F 20 '15

N. E. L. A. accounting section. L. M. Wallace. Elec W 65:644 Mr 13 '15

Small-customer question. H. E. Eisenmenger. Elec R & W Elec'n 67:557-62 O 9 '15

Small-town distribution and management cost. E. A. Wright. Elec W 65:338-41 F 6 '15

System of accounting for central-station companies. Elec R & W Elec'n 67:228 Ag 7 '15

### Advertising

Advertising
Advertising electricity to manufacturers. Elec W 65:547-9 F 27 '15
Attracting the good will of 2,500,000 people. Elec W 66:024-5 N 6 '15
Campaigning past the saturation point. Elec W 66:814-15 O 9 '15
Carrying the display room to the customer, il Elec W 66:28-30 Jl 3 '15
Cheap-residence wiring campaign of the Lehigh valley light & power company. Elec W 65:425-6 F 13 '15
Commercial lighting campaign in Salt Lake City. il Elec R & W Elec'n 66:417-18 Mr 6 '15

6 '15
Efficiency and comfort in the home; views of model apartments. Elec W 66:207 Jl 24 '15
Electric range advertisement that sold 22 ranges. Elec R & W Elec'n 67:971 N 27 '15
Electrical Fourth in your town. il Elec W 65: 1696-7 Je 26 '15
Platiron sold every seyen seconds. Elec W 66: 200-1 Jl 24 '15

Getting ready for moving day—enlisting the public's help. Elec W 66:649 S 18 '15 House electric at Rockford, Ill. il Elec R & W Elec'n 66:680-1 Ap 10 '15

How 700 houses were wired in one year at Topeka, Kan. Elec W 65:117-18 Ja 9 '15

Kansas City, Mo. keeps up load-building. Elec R & W Elec'n 65:1209-10 D 26'14
N. E. L. A. committee report on merchandising and recent developments in electrical appliances. Elec W 65:1522-3 Je 12'15; Elec R & W Elec'n 66:1109 Je 12'15
Obtaining the good will of the public. Elec R & W Elec'n 67:146-7 Jl 24'15
Old-house-wiring campaign. E. R. Davenport. Elec W 65:388-9 F 13'15
Practical policy of local co-operation and the story of a six-day appliance sale in Dayton, Ohio. Elec W 66:645-6 S 18'15
Premium plan that wired 250 houses in Minneapolis. Elec W 66:447-19 Ag 21'15
Public-school boy as a pathfinder. Elec W 66:95-6 Jl 10'15
Results of fall housewiring campaign at Ko-

Public-school boy as a pathfinder. Elec W 66; 95-6 J1 10 '15
Results of fall housewiring campaign at Kokomo, Ind. il Elec W 64:1206 D 19 '14
Selling in the irrigation country. il Elec W 65:1414-17 My 29 '15
Service panel introduces electricity in many homes, plan Elec W 65:738 Mr 20 '15
Shall the central station sell appliances? J. H. Moseley. Elec R & W Elec'n 67:466-9 S 11 '15
Smashing iron slide slogan of Rome (N. Y.) sales campaign, il Elec W 66:648 S 18 '15
Stage craft in the electric shop, M. J. Russell, il Elec W 65:1693-5 Je 26 '15
Starting Christmas sales with prosperity week, il Elec W 66:1192-4 N 27 '15
Telling the story of public service to the public. Elec W 66:1202 N 27 '15
Topeka house-wiring campaign shows immediate profit. Elec W 66:1195-6 N 27 '15
Typical house and the testimonial: advertising campaign at Louisville, Ky. Elec W 66: 305-7 Ag 7 '15
Unique type of central-station newspaper advertising. Elec R & W Elec'n 67:338 N 6 '15
Value of advertising. A. Williams, il Elec W 65:1001-2 Ap 17 '15
What advertising has done for the Denver company. Elec R & W Elec'n 66:722-3 Ap 17 '15
White way as a business getter for the cen-

White way as a business getter for the cen-tral station. il Elec W 65:1697 Je 26 '15 Window suggestions for Thanksgiving and electrical prosperity week. il Elec W 66:1097 N 13 '15

Winning old houses by special inducement. Elec W 66:145-6 Jl 17 '15

See also Electrical prosperity week

# Finance

Application of the diversity-factor; abstract. H. B. Gear. Elec W 65:1515-16 Je 12 '15
Boston Edison company's steady growth. Elec R & W Elec'n 67:509 S 18 '15
Continued gain in light and power industry. Elec W 66:456-8 Ag 28 '15
Electrical securities and the central-station industry in 1914—prospects for 1915. J. M. C. Hampson. Elec R & W Elec'n 66:19-20 Ja 2 '15

Financial needs of the electrical industry. F. A. Vanderlip. Elec W 66:684-5 S 25 '15 Kansas City plan filed. Elec Ry J 46:330-1 Ag 21 '15

Pacific gas and electric company's 9th annual report. Elec W 66:427-8 Ag 21 '15

Salesmen's ideas on minimum monthly bills, il Elec W 66:147 Jl 17 '15

Southern California Edison company a report, 1914. Elec W 65:1032 Ap 24 '15

See also Electric service companies—Accounting; Electric service companies—Valuation of property

# Franchises

Agreement reached in important utilities consolidation. Elec R & W Elec'n 66:4 Ja 2 '15

# Law

Liability of electric company using joint poles. Elec W 64:1154 D 12 '14

## Management

Applying the show-me policy in motor-service sales. il Elec W 65:1060 Ap 24 '15

Campaign to reduce delinquency; a five-year record by the American gas & electric com-pany's properties. Elec W 65:998-9 Ap 17 '15

Electric service companies-Management-Cont. Card index increases efficiency of new-business department. Elec R & W Elec'n 66:899-900

department. Elec R & W Elec'n 66:899-900
My 1-15
Central-station practice in renting motors.
Elec R & W Elec'n 67:805 O 2 '15
Central-station sales department organization and work. F. D. Beardslee. Elec R & W Elec'n 66:1073-9 D 5 '14
Contract-order routine in Louisville. Elec R & W Elec'n 66:29-30 Ja 2 '15
Details of Cincinnati appliance campaign. Elec R & W Elec'n 67:360-1 Ag 28 '15
High cost of rendering bills. Elec R & W Elec'n 67:478 S 11 '15
How can gas and electric companies under one management render the best light service?
A. B. Spaulding and N. H. Potter. Am Gas Light J 103:218-19 O 4 '15
Mapping the motor opportunity, map Elec W 65:1199-1200 My 8 '15
Merchandising by central stations. T. I. Jones. il Elec W 65:227-9 Ja 23 '15
Office and stock-room methods. Elec W 65:1036

Office and stock-room methods. Elec W 65:1036 Ap 24 '15

Ap 24 '15
Power development methods for Iowa central stations. E: Soukup. Elec R & W Elec'n 66: \$07-8 My 1 '15
Results of two years of motor leasing by group of New England companies. Elec W 66:1150 N 20 '15

66:1150 N 20 '15
Resumption of sale of appliances by Rochester
company, il Elec W 66:257-8 Jl 31 '15
Sale of current to municipally owned distributing systems by central stations. W. R.
Collier, Elec R & W Elec'n 67:890-3 N 13 '15
Sale of electric power, T. R. Hay. Elec R &

Secrets of successful merchandising. il Elec W 65:1637-9 Je 19 '15

Selling lamp-socket appliances; an analysis of eleven years' experience in marketing electric household devices in southern California. S. M. Kennedy. Elec W 65:1412-14 My 29 '15

29 '15
Service rules of twelve central stations. Z. D.
Mayhew, il diag Elec W 65:1057-9 Ap 24 '15
Should the salesman collect money? E. E.
Whitehorne. Elec W 66:921-3 O 23 '15
Successful policies that promote beneficial relations between central stations and contractors. Elec W 66:1098 N 13 '15

# Offices

Electrical equipment and efficient features of the new office building of the Hartford elec-tric light company. il diag Elec W 65:206-9 Ja 23 '15 Electrical features of new office building of New Bedford, Mass., central station. il Elec R & W Elec'n 67:507-8 S 18 '15

# Public relations

Public relations

Baby bond that guarantees paid bills. G: B.

Saunders. Elec W 66:1034-5 N 6 '15

Central-station publicity campaign in a municipal lighting plant situation. Elec R & W Elec'n 66:856-7 My 8 '15

Electric service as a reason for town pride.

E. B. Fenton. Elec W 66:757-8 O 2 '15

Keeping industrial-motor users satisfied. Elec W 65:175-6 Ja 16 '15

N. E. L. A. public policy committee report.

Elec W 65:1510-11 Je 12 '15; Elec R & W Elec'n 66:1107 Je 12 '15

Cld-husiness department to serve the com-

Old-business department to serve the company's old friends. Elec W 66:595 S 11 '15

Progressive public policy and its results. il Elec W 65:470-2 F 20 '15

Public relations as business assets. Elec W 66: 742-3 O 2 '15

Stimulating friendly relations by sale of baby bonds. Elec R & W Elec'n 67:510-11 S 18 '15

# Rates

See Electric lighting-Rates; Electric power-Rates Regulation

Beaver river power and light company. Elec R & W Elec'n 66:631-2 Ap 3 '15
Best control of public utilities. F. G. Baum. Am Inst E E Pro 34:1-23 Ja '15; Abstract. Elec W 65:258-9 Ja 23 '15

Bloomer, Wis., electric light & power company; electric service from rural districts. Elec R & W Elec'n 67:848-9 N 6 '15 Canada voices its right to forbid the exportation of electrical energy. Elec W 65:311-12

Decision by Oregon commission, with table of costs for different classes of consumers of the Hood River gas and electric company. Elec W 66:431 Ag 21 '15 Hearings on water-power bill. Elec W 64:1189 D 19 '14

D 19 14

Massachusetts commission advises against central-station ice-making. Elec W 65:498
F 20 '15; Elec R & W Elec'n 66:335 F 20 '15

Merger of Buffalo companies authorized. Elec W 65:37-8 Jl 3 '15

Municipal regulation of public utilities; abstracts. J: H. Roemer. Elec W 65:1511-12 Je 12 '15; Elec R & W Elec'n 66:1107-8 Je 12 '15

Public utility regulation in California; abstract. M. Thelen. Elec W 65:1512 Je 12 '15

Rates and by-products. J. R. Cravath. Elec W 65:1029 Ap 24 '15

Standards for gas and electric service in Illinois. Eng N 72:1148-9 D 10 '14

State commission with jurisdiction over electrical utilities; map. Elec W 65:1597 Je 19 '15

# Rural service

See Electric service, Rural

Valuation of property

Valuation of property

Appraisement of small electric properties.
E. D. Dreyfus. Elec R & W Elec'n 66:433-8,
500-5 Mr 6-13 '15
Cincinnati rate case. Elec W 66:377-8 Ag 14 '15
Indianapolis electric rate cases. Elec R & W
Elec'n 67:235-7 Ag 7 '15
Symposium on inventories and appraisals of
properties. C. L. Cory; W. G. Vincent, jr.;
W: J. Norton. Am Inst E E Pro 34:2131-58

Valuation of the property of the Kansas City electric light company. Elec W 65:1343 My 22 '15

Electric shock
Causes of electrical accidents in English collieries. diag Elec R & W Elec'n 67:903 N
13 '15

13 '15
 Contest in rescue and resuscitation work between line crews. il Elec W 66:1015 N 6 '15
 Electric shock. Elec R & W Elec'n 66:686-7
 Ap 10 '15
 Safety in stone quarrying; treatment for electric shock. O. Bowles. il U S Bur Mines Tech Pa 111:40-3 '15

Electric shops

Electric shops

Business hints for dealers. G. D. Crain, jr. Elec R & W Elec'n 66:809-10; 67:664-5, 755-6, 932-3 My 1, O 9, 23, N 20 '15

Christmas merchandising co-operation—ready for you il Elec W 66:1199-1200 N 27 '15

Competing for appliance business. il Elec W 65:1053-6 Ap 24 '15

Electric-heating appliance salesroom. il Elec W 65:800-3 Mr 27 '15

Formal opening of Commonwealth Edison company's new office building, Chicago. il Elec R & W Elec'n 67:584-5 S 25 '15

How to merchandise electrical appliances. J. V. Guilfoyle, il Elec W 65:541-3 F 27 '15

Jobbing policy with service as the watchword, il Elec W 66:1094-5 N 13 '15

Keeping the electric shop awake and working, il Elec W 66:593-5 S 11 '15

Marketing electricity. il Elec W 66:703 S 25 '15

Marketing electricity, il Elec W 66:703 S 25 '15 Merchandising by central stations. T. I. Jones. il Elec W 65:227-9 Ja 23 '15

Problems of slow-moving stock. il Elec W 66: 471-4 Ag 28 '15

Stage craft in the electric shop. M. J. Russell. il Elec W 65:1693-5 Je 26'15

Starting Christmas sales with prosperity week, il Elec W 66:1192-4 N 27 '15

Year of sales at Providence, R. I. il Elec W 65:1311-15 My 22 '15

See also Electric railroads-Shops

Electric shops, Municipal
Kansas City has municipal electric shop. Elec
R & W Elec'n 66:34 Ja 2 '15

Electric shovels

lectric shovels

Alternating-current controllers for steel mills,

A. Simon, il Am Inst E E Pro 34:743-5 My
'15; Same, Iron Tr R 57:527-8 S 16'15

Costs of electric shovel work at Cleveland, il

Elec Ry J 44:1261-2 D 5'14; Same, Elec R

& W Elec'n 66:172-3 Ja 23'15

Low-clearance mechanical shovel, diags Eng
M 49:914-15 S'15

Methods and costs of electric shovel work, res-

M 49:314-15 S '15 Methods and costs of electric shovel work; re-moving slides and side cutting for electric railway, diags Eng & Contr 43:154-5 F 17 '15 Thew electric shovel for railway work, il Elec Py J 46:681-2 O 2 '15

Electric signals

Alternating current signaling. Elec Ry J 46:880 O 23 '15

Alternating current signaling. Elec Ry J 46:880 O 23 '15
Battery bell signaling in English mines. R. V. Wheeler. Elec R & W Elec'n 66:903-4 My 15 '15; Same. Elec W 65:1304 My 22 '15
Development of main-line signalling on railways. W. C. Acfield. diags Inst E E J 53: 763-84; Discussion. 53:784-98 Je 1 '15
Electric shriek to warn mariners: Blériot air siren. il Sci Am 112:200 F 27 '15
Electric signal horns for factories. il Elec R & W Elec'n 67:993 N 27 '15
Electric train staff on the Canadian Pacific. E. S. Taylor. diags Ry Age 58:100-1 Ja 15 '15
Electrical system of cab-signalling. V. L. Raven. il diags Engineer 119:85-6 Ja 22 '15
Hospital signal-lighting system. diag Elec W 66:1219 N 27 '15
Method to notify firemen when chimneys smoke. diag Elec W 66:301-2 Ag 7 '15
Paint twin cableways red and blue for electric signal system. H. E. Ketchum. il Eng. Rec 72:117 Jl 24 '15
Protection of railway signal circuits against lightning disturbances. E. K. Shelton. Gen Elec R 18:1127-8 D '15
Real signaling devices for automobiles. il Sci Am 113:274-5 S 25 '15

\*\*Sec also Electric alarms: Electric railroads.\*\*Signals: Fessenden. oscillator: Interlocking.\*\*

See also Electric alarms: Electric railroads—Signals; Fessenden oscillator; Interlocking plants; Mine signals; Railroads—Signals

Electric signs

Chase changeable signs. il Elec R & W Elec'n 67:991 N 27 '15 Christmas sign of the Houghton & Dutton company, il Elec R & W Elec'n 65:1171 D 19

'14
Effective sign for newspaper, il Elec R & W
Elec'n 67:509 S 18 '15
Elaborate electrical Christmas displays at
Boston, il Elec W 64:1219 D 19 '14
Electric signs of London tube railways, il Elec
R & W Elec'n 66:25 Ja 2 '15
Electrical advertising, il Elec R & W Elec'n
65:1080 D 5 '14
Electrically operated motion signs on horsedrawn trucks, il Elec R & W Elec'n 67:992
N 27 '15

Electrograph. Elec R & W Elec'n 66:1067 Je

Modeling of electrically lighted designs. il Elec R & W Elec'n 66:32 Ja 2 '15 Novel electric sign at Port Arthur, Tex. il Elec R & W Elec'n 66:241 F 6 '15; Same. Elec W 65:426 F 13 '15 Electrical State R & W

K & W Elec'n 66:241 F 6 '15; Same. Elec W 65:426 F 13 '15
Sign installation in Cincinnati. il Elec R & W Elec'n 65:1169 D 19 '14
Spectacular electrical display erected by St. Louis central station, il Elec R & W Elec'n 67:999-10 N 13 '15
Spectacular gas and electric sign in Louis-ville attracts attention. il Elec R & W Elec'n 67:969-70 N 27 '15
Spectacular sign of Ford motor company. il Elec R & W Elec'n 66:983-4 My 29 '15
Spectacular theater sign in Cincinnati. il Elec R & W Elec'n 66:336 F 20 '15
Steel frame for a large electric sign. diags Eng N 73:1071 Je 3 '15
Talking signs; prevention of arcing. Elec R & W Elec'n 67:978-9 N 27 '15
Unique Chinese sign. il Elec R & W Elec'n 66: 111 Ja 16 '15
Unique lighting of Seattle theater. il Elec R & W Elec'n 66:377 F 27 '15
Laws and regulations

Laws and regulations Electric sign legislation in Massachusetts. Elec R & W Elec'n 66:420 Mr 6 '15 Electric sounding. See Sounding

Electric sparks

Magneto spark vs. battery-coil spark. D. H. Cunningham. Automobile 31:1020-3 D 3 '14

Electric standards

lectric standards
British standardization rules. Elec W 65:1245
My 15 '15
Construction of primary mercurial resistance
standards; abstract. F. A. Wolff, M. P.
Shoemaker, and C. A. Briggs. J Fr Inst 180:
104-6 Jl '15
N. E. L. A. report on standardizing plugs and
receptacles. Elec W 65:256-7 Ja 23 '15; Same.
Elec R & W Elec'n 66:245 F 6 '15
New A. I. E. E. standardization rules. Elec Ry
J 44:1232 D 5 '14
Nominal rating of railway motors. G. H. Hill.

J 44:1232 D 5 '14

Nominal rating of railway motors, G. H. Hill, Elec Ry J 46:275-6 Ag 14 '15

Pennsylvania overhead line crossing specifications, Elec Ry J 46:186 Jl 31 '15

Standardization of plugs and receptacles, il Elec W 65:567-8 F 27 '15

Standardization rules of the American institute of electrical engineers; approved by the board of directors, June 30th, 1915, to take effect July 1, 1915. Am Inst E E Pro 34:1939-2041 Ag '15

Electric starters

Momentary current of starting motors. B: F. Bailey, Horseless Age 35:850 Je 23 '15 Same starting equipment for large and small machines, il plan Elec W 65:420-1 F 13 '15 See also Automobiles—Starting devices; Electric motors-Starting devices

Electric sterilization

Electric sterilization of milk. Elec R & W Electric sterilization of milk. Elec R & W Elec'n 67:994 N 27 '15 Electricity for sterilizing purposes. W. B. Un-derwood. il Elec W 65:34 Ja 2 '15 Purification of milk by electricity. il Elec W 64:1153-4 D 12 '14

Electric stoves lectric stoves

Effect of electric ranges on central-station load in Seattle. Elec W 66:646-7 S 18 '15

Globe electric ranges, il Elec R & W Elec'n 67: 340-1 Ag 21 '15

Large-sized electric-cooking apparatus. il Elec W 66:1163-4 N 20 '15

Neuco electric cooking appliances, il Elec R & W Elec'n 67:343-4 Ag 21 '15

New types of Globe electric ranges and stoves, il Elec R & W Elec'n 67:397 N 13 '15

69-kw. electric range to cook for 1500 hospital patients and employees, il Elec W 66:1162 N 20 '15

Unit-part electric range, il Elec W 66:884-5 O

Unit-part electric range, il Elec W 66:884-5 O 16 '15

Electric street sweepers. See Street cleaning apparatus. Electric

Electric strength of air. J. B. Whitehead. Am Inst E E Pro 34:843-65 My '15; Discussion. 34:2997-3005 D '15

Electric substations. See Electric plants—Substations; Electric railroads—Substations

Electric supplies. See Electric industries; Electric shops

Electric supply company, Memphis, Tennessee Notable southern jobber, il Elec R & W Elec'n 66:526-7 Mr 20 15

Electric switchboards. See Switchboards

Electric switches

Electric switches

Arc phenomena. A. G. Collis. il diags Am Inst
E E Pro 34:2081-2100 S '15

Arcing characteristics of air-break switches.
C: E. Bennett. il Elec W 66:853-5 O 16 '15

Automatic starting switches for small alternating-current motors. il Elec R & W Elec'n
66:1007 My 29 '15

Balanced disconnecting switch. il Elec R &
W Elec'n 67:632 O 2 '15

Battery switches—charge indicators. P. M.
Heldt. diags Horseless Age 35:740-2 Je 2
'15

Brush-type lever switch, il Elec W 66:603 S

Demountable switch, il Elec W 65:875 Ap 3

Developments in electrical apparatus during 1914. J: Liston. il diags Gen Elec R 18:90-2 F '15

Electric switches -Continued

Disconnecting switch with torsional-balanced blade il Elec W 66:939 O 23 '15

Double-ear overhead switch, il Elec Ry J 46:1091 N 27 '15

Electrically wound time switch, il Elec R & W Elec'n 66:1066 Je 5 '15

Entrance switch and stage pocket, il Elec R & W Elec'n 66:1193 D 19 '14

Fused switch that prevents replacement of fuses while switch is closed, il Elec W 66: 602-3 S 11 '15

High-tension switch gear arrangements, T. T. Evans, il Engineer 119:461-2 My 7 '15

High-tension switching systems, J: A. Randolph, Power 41:434-3 Mr 30 '15

High-voltage, three-phase air-break switch, il Elec W 66:938 O 23 '15

Improved disconnecting switches and busbar supports for large generating plants, il Elec

Improved disconnecting switches and busbar supports for large generating plants. il Elec R & W Elec'n 67:722-31 O 16 '15; Elec W 66: 883-4 O 16 '15
Improved tripping mechanism for oil switch. diag Elec W 65:39 Ja 2 '15
Interchangeable high-tension switches. C. Opitz. diag Elec W 66:124 Jl 17 '15
Lever switches for low-voltage circuits. il Elec W 66:1163 N 20 '15
New Jine of Cutter-Hammer magnetic switches.

New line of Cutler-Hammer magnetic switches.

il Elec R & W Elec'n 65:1099 D 5 '14 Oil knife switches. il Elec Ry J 46:157 Jl 24

Oil-switch explosions. Elec W 65:1154 My 8

Outdoor switch houses. il Elec R & W Elec'n 67:33-4 Jl 3 '15 Recent developments in switchboard apparatus. E. H. Beckert. il diags Gen Elec R 18: 646-57 Jl '15

b4b-57 J1 15 Same starting equipment for large and small machines, il plan Elec W 65:420-1 F 13 '15 Service switch arranged for disconnection of fuses before handling, il Elec R & W Elec'n 67:144 S 4 '15

Simple battery switching scheme for operating oil circuit-breakers, diag Elec W 66: 1091 N 13 '15
Six-ampere pull switch, il Elec W 66:1222 N

Switch designed to exclude insects, il Elec W

Switch designed to exclude insects. il Elec W 66:304 Ag 7 '15 Switching equipment in plant of Indiana railway & light company. il Elec R & W Elec'n 66:926 My 15 '15 Tank lifters for small oil switches. il Elec Ry J 46:71-2 Jl 10 '15; Iron Age 96:185 Jl 22 '15; Power 42:156 Ag 3 '15 Three-in-one oil and disconnecting switch. il Elec W 66:1105-6 N 13 '15 Time switch for series-tungsten street-lighting system. J. P. Byron. diags Elec W 65:223 Ja 23 '15

Electric symbols

International symbols; report issued by the International electrotechnical commission.

International symbols; report issued by the International electrotechnical commission. Inst E E J 53:106-8 D 15 '14 Standardization rules of the American institute of electrical engineers; approved by the board of directors, June 30th, 1915, to take effect July 1, 1915. Am Inst E E Pro 34:1946-8 Ag '15

8 Ag '15 Units and notation; abstract. Elec W 64:1116 D 5 '14

Electric taxicabs. See Taxicabs, Electric

Electric terminology, See Electric wire and wiring—Terminology; Electricity—Terminology

Electric testing

lectric testing
Automatic cevice for timing relay and fuse operation. plan Elec W 65:608-9 Mr 6 '15
Effect of altitude on the spark-over voltages of bushings, leads and insulators. F. W. Peek, jr. il diags Am Inst E E Pro 33:1877-86 D '14; Same, Gen Elec R 18:137-42 F '15; Discussion. Am Inst E E Pro 34:1328-49 Je

Field and armature tester, il Elec W 66:262

JI 31 '15 High-tension

Ji 31 '15 High-tension test. W: P. Woodward, il Gen Elec R 18:398-401 My '15 Life-testing equipment for tungsten lamps; electrical features of the incandescent lamp-testing laboratory at Nela Park, Cleveland, il plan Elec W 66:12-16 Jl 3 '15

Measuring the current in d. c. circuits. O: A. Knopp. il diags Elec W 66:751-2 O 2 '15 Methods of testing the Scherbius compensator. A. A. Ahmed. Inst E E J 53:640-8 My 1 '15 Polarity tester. diag Engineer 118:550 D 11 '14; Same. Elec W 65:102 Ja 9 '15 Portable car testing set. D. D. Ewing. plan Elec Ry J 46:152 Jl 24 '15 Production of damped oscillations. L. O. Heath. diags Gen Elec R 18:1110-17 D '15 Proper construction of earth connections. G. H. Rettew. Gen Elec R 18:904-7 S '15; Abstract. Engineer 120:462 N 12 '15 Series of electrical tests made in 1883 and their influence on modern testing. A. L. Rohrer. Gen Elec R 18:22-4 Ja '15 Testing of potentiometers. F. Wenner and E. Weibel. il diags U S Bur Stand Bul 11:1-40 N 15 '14

Voltage and insulation-resistance tests for wires of various sizes. Elec W 65:1050 Ap

Voltage testing of cables. W. I. Middleton and C. L. Dawes. il diag Am Inst E E Pro 33: 987-1008 Je '14; Abstract, Elec R & W Elec'n 65:32-3 J1 4 '14; Discussion. Am Inst E E Pro 34:70-8 Ja '15

See also Dynamometers; Electric lamps, Tungsten—Testing; Electric measurement; Electric meters; Electric motors—Testing; Electric resistance; Electric transformers—

Electric toasters

Electric toaster with rack for drying bread and keeping toast warm, il Elec W 66:1217 N 27 '15

Marketing of a new electrical toy. Elec R & W Elec'n 67:980 N 27 '15 Promoting electric cooking through the rising generation. il Elec W 66:1197-8 N 27 '15 Recent developments in electrically operated toys. il Elec W 66:1214-17 N 27 '15

Storage-battery-drive tractor. G: Boughner. Munic Eng 49:150 O '15

Electric transformers

Abnormal voltages in transformers, J. M. Weed. Am Inst E E Pro 34:1621-56 Ag '15
Avoiding the no-load losses in transformers; abstract. B. Thierbach. Elec W 65:1117-18
My 1 '15

My 1 '15
Bell-ringing, toy and sign-lighting transformers, il Elec R & W Elec'n 67:948 N 20 '15
Bell-ringing transformers, il diags Elec R & W
Elec'n 66:150-1 Ja 23 '15
Care of transformers, Elec W 65:1198 My 8 '15
Cleaning transformer cooling coils, Elec R
& W Elec'n 67:566 S 25 '15
Compounding transformers; abstract, L. Dreyfus, Elec W 66:410 Ag 21 '15
Constant-current transformer, J; A. Randolph, diags Power 41:153-6 F 2 '15
Current transformer, A. G. L. McNaughton, Inst E E J 53:269-71 F 1 '15

Delta-cross connections of transformers for parallel operation of two- and three-phase systems. G: P. Roux. diags Am Inst E E Pro 34:1683-94 Ag '15

Design of stationary transformers, S. Cabot and C. F. Cairns. Elec W 66:459-63 Ag 28 '15

Designing small transformers. N. G. Meade. Power 41:262-3 F 23 '15

Dimensions of transformers, A. R. Low, bibliog diags Inst E E J 53:512-21 Ap 1 '15

Drying high-tension transformers with steam heat, diag Elec W 65:676 Mr 13 15

Drying large transformer units electrically, il Elec W 65:736-7 Mr 20 '15

Effect of delta and star connections upon transformer wave forms. L. F. Curtis. Am Inst E E Pro 33:1153-7 Ag '14; Discussion. 34:125-9 Ja '15

Effect of third harmonic in voltage wave. Powell. diags Elec W 65:157-8 Ja 16 '15

Effects of frequency upon transformers. G. Fox. diag Elec R & W Elec'n 66:89 Ja 9 '15; Same. Power 42:401 S 21 '15

Emergency transformer connec Roux. Gen Elec R 18:832-5 Ag connections. G: P. 2-5 Ag '15

lectric transformers—Continued
Form factor and its significance. F: Bedell,
R. Bown and H. A. Pidgeon. Am Inst E E
Pro 34:1051-8 Je '15; Abstract. Elec W 66:7
J1 3 '15

Fused transformer cut-out, diag Elec W 66:

15

772 O 2 '15

Harmonics in transformer magnetizing currents, J. F. Peters, diags Am Inst E E Pro 34:1657-73 Ag '15

Mechanical forces in circuits carrying heavy currents; abstract. P. V. Hunter. Elec W 64: 1259 D 26 '14

Mechanical stresses in shell-type transformers. J. M. Weed, il diags Gen Elec R 18:60-4

Ja '15 Million-volt transformer to be demonstrated at

the Panama-Pacific exposition. N. Willson. il Elec R & W Elec'n 67:945-6 N 20 '15 Miniature transformers. il Elec W 66:1221 N

Miniature transformers, il Elec W 66:1221 N 27 '15

Number system keeps track of transformers, il Elec W 66:190 Jl 24 '15

Open-circuited compensator, J. A. Horton, diag Power 41:617-18 My 4 '15

Open delta connection for transformers, Engineer 120:262-3 N 10 '15

Open-delta or V-connection of transformers, G: P. Roux, Gen Elec R 18:52-5 Ja '15

Operation and design of auto-transformers, N. G. Meade, diags Power 41:804-6 Je 15 '15

Operation of transformer used with 2 kw. 100,000 cycle alternator, S. P. Nixdorff, Gen Elec R 18:308-9 Ap '15

Parallel operation of transformers; abstract, R. H. Willard, diags Elec W 66:76 Jl 10 '15

Phase angle of current transformers. C. L. Dawes, Am Inst E E Pro 34:927-40 My '15

Phenomena accompanying transmission with some types of star transformer connections. L. N. Robinson, Am Inst E E Pro 34:1675-81

Ag '15

Points to be considered when drying out transformers. Elec W 66:1208 N 27 '15

Ag '15
Points to be considered when drying out transformers. Elec W 66:1208 N 27 '15
Principal factors governing the choice of method of cooling power transformers as related to their first cost and operating conditions. W. S. Moody. il Gen Elec R 18: 839-41 Ag '15
Radiator-type transformers for the New Haven system. il diags Elec W 65:491-3 F 20

Report on switch and transformer oils. W. P. Digby. Inst E E J 53:146-56 Ja 1 '15; Abstract. Elec W 65:345-6 F 6 '15'
Series transformer for gas-filled tungsten street lamps. il Elec R & W Elec'n 66:38 Ja 2 '15'

Serving three-phase motor loads. R. E. Cunningham. il diag Elec W 66:588 S 11 '15 Single-phase loads from polyphase systems. Engineer 120:185-6 Ag 20 '15 Some transformer connections. G. Fox. diags Power 41:46-8 Ja 12 '15

Transformer connections. A. A. Fredericks. Power 41:381-2 Mr 16 '15 Transformer fuse block, il Elec W 65:178-9 Ja

16

Transformer stresses; abstract, W. E. Burnand, Elec W 66:541 S 4 '15 Transformer winding, diag Elec R & W Elec'n 67:478-80 S 11 '15

67:478-80 S 11 '15 Transmission session of the Am. Inst. E. E. Elec R & W Elec'n 67:572-3 S 25 '15 Voltage and current relations in open-delta-connected transformers, B. F. Jakobsen. Elec W 66:17-18 Jl 3 '15 Wiring a transformer bank from one end. il Elec W 66:254-5 Jl 31 '15

See also Electric current rectifiers; Electric irrents; Electric distribution; Induction currents:

coils; Rotary converters

# Testing

Calibration of current transformers by means of mutual inductance. C: Fortescue. diags pls Am Inst E E Pro 34:1199-1215 Je '15 Watt-hour meter method of testing instrument transformers. P. G. Agnew. diags U S Bur Stand Bul 11:347-57 My 10 '15; Summary. Elec R & W Elec'n 65:1146-7 D 12

Electric transmission

Ricker, il Elec W 66:634-5 S 18 '15

Bombay hydro-electric scheme. A. Dickinson, maps diags plans Inst E E J 53:693-714 My 15 '15; Discussion. 53:715-21, 802-4 My 15-Je

Calculation of the long distance transmission line under constant alternating voltage. G: R. Dean. Am Inst E E Pro 34:2241-62 O

'15
Central-station development at Portland, Me. il diags Elec W 65:590-6 Mr 6 '15
Delta-cross connections of transformers for parallel operation of two- and three-phase systems. G: P. Roux. diags Am Inst E E Pro 34:1683-94 Ag '15
Discussion on transmission lines. (See Proceedings for June and July, 1915) Am Inst E E Pro 34:3117-26 D '15
Distributing potential over a string of insula-

E E Pro 34:3117-26 D '15
Distributing potential over a string of insulators. J. L. Brenneman and H. M. Crothers. diags Elec W 64:1095-9 D 5 '14
Effect of delta and star connections upon transformer wave forms. L. F. Curtis. Am Inst E E Pro 33:1153-7 Ag '14; Discussion. 34:125-9 Ja '15

34:125-9 Ja '15
Electric service in and near Peoria, Ill. il map
Elec W 65:281-5 Ja 30 '15
Electric transmission of power. R. E. Argersinger. il Gen Elec R 18:454-9 Je '15
Energy transmission work of 1914. L: Bell.
Elec W 65:21-2 Ja 2 '15
Engineering data relating to high-tension
transmission systems; discussion. Am Inst
E E Pro 34:284-99 F '15
Experiments on the heating of screw-socket

E E Pro 34:284-99 F '15
Experiments on the heating of screw-socket lampholders. C. C. Paterson. il diags Inst E E J 53:14-21 D 1 '14
Flow of energy. R. A. Phillip. diags Am Inst E E Pro 34:455-84 Ap '15; Same. W Soc E J 20:444-72 My '15; Same cond. Engineer 120: 67-9 Jl 16 '15; Same cond. Power 42:352-5 S 7 '15; Discussion. W Soc E J 20:472-7 My '15
Four years' operating experience on a high-tension transmission line. A. Bang. diag pls Am Inst E E Pro 34:1425-45 Jl '15; Abstract. Elec W 66:10-11 Jl 3 '15
Future operation of long electric transmission lines. R. A. Philip. il Eng N 73:438-9 Mr 4 '15

Georgia-Carolina company transmission system. il diags Elec W 66:1189-91 N 27 '15
High-tension power transmission problems discussed at December A. I. E. E. meeting. diags Elec Ry J 44:1348 D 19 '14
High-voltage transmission at high altitude. P. H. Thomas. il diags plan Elec W 65:29-34, 87-92 Ja 2-9 '15

Cal. C. O. Poole, il diags map Elec W 64: 1045-7, 1093-4, 1143-7, 1193-6 N 28-D 19 '14

Insulator performance from operating viewpoint. E. P. Peck. il Elec W 66:1077-9 N 13

Interconnected systems serving San Francisco; details of the generating equipments and transmitting circuits tied in with the larger system of the Pacific gas & electric company, which covers half of California, il diags map Elec W 65:1356-82 My 29 '15 Interior wiring for lighting and power service. A. L. Cook. Power 41:702-6 My 25 '15

Labor-saving transmission-line chart: calculating voltage drop on overhead alternating-current system. H. B. Dwight. Elec W 65: 159-61 Ja 16'15

Long transmission lines completed by the Stone & Webster engineering corporation. R. A. Philip, diags Elec R & W Elec'n 65: 1222-3 D 26'14

C. E. L. A. hydroelectric and transmission committee report. Elec W 65:1517-18 Je 12 '15

Newcastle local section; chairman's address. P. V. Hunter, diag Inst E E J 53:102-6 D 15 '14

One boiler room instead of fifty; Cabin Creek plant of the Virginia power company, il diags Elec W 66:286-91 Ag 7 '15

115,000-volt hydroelectric system in Japan. il diags plan Elec W 65:1599-1606, 1671-8 Je 19-26 '15

Electric transmission -Continued

150,000-volt transmission system: some operat-150,000-Volt transmission system; some operating conditions of the Big Creek development of the Pacific light & power corporation. E: Woodbury. il Am Inst E E Pro 33; 1359-70 S '14; Discussion. 34:130-3 Ja '15 Open-delta or V-connection of transformers. G: P. Roux. Gen Elec R 18:52-5 Ja '15 Overhead construction work at Khopoli, Bombay, diags Elec R & W Elec'n 66:914-15 My 15 '15

bay. 6

Phenomena accompanying transmission with some types of star transformer connections, L. N. Robinson, Am Inst E E Pro 34:1675-81 Ag '15

rotection and control of industrial electric power. C: P. Steinmetz. il Gen Elec R 18: Protection

979-85 O 15 Sphere gap as a means of measuring high vol-tage; discussion. F. W. Peek, jr. Am Inst E E Pro 34:103-24 Ja '15 Sphere gap discharge voltages at high frequen-cies; discussion. J. C. Clark and H. J. Ryan. Am Inst E E Pro 34:103-24 Ja '15 Static electricity from transmission lines. C. O. Poole. diag Elec W 65:773 Mr 27 '15 Theoretical investigation of electric transmis-sion systems under short circuit conditions

Ineoretical investigation of electric transmission systems under short circuit conditions. I. W. Gross. Am Inst E E Pro 34:25-69 Ja '15; Abstracts with discussion. Elec R & W Elec'n 66:126-7 Ja 16 '15; Elec W 65:163-4 Ja 16 '15; Discussion. Am Inst E E Pro 34:2851-68 N '15

Theory of electric waves in transmission lines J. M. Weed. diags Gen Elec R 18:1148-53 D '15

Thury system of direct current transmission.

Thury system of direct current transmission. W: Baum. bibliog il diags map Gen Elec R 18:1026-41 N '15
Transmission line calculator. R. W. Adams. diags Gen Elec R 18:28-30 Ja '15
Transmission-line construction for mountain districts. H. M. Somerville. il diag Elec W 66:862-3 O 16 '15
Transmission system of the electrified divisions, C. M. & St. P. Ry. R. E. Wade. il Ry R 57:203-5 Ag 14 '15
Trigonometric expressions for the phenomena

Trigonometric expressions for the phenomena occurring in long-distance transmission lines. V. Karapetoff. Elec W 66:857-60, 914-15 O 16-23 '15

15 O 16-23 '15 200-mile artificial transmission line. C. E: Magnusson, J. Gooderham and R. Rader. il diags Elec W 65:1545-9 Je 12 '15 Wiring and conduit work at the Panama-Pa-cific exposition. A. A. Willoughby. diag Elec R & W Elec'n 67:432-5, 472-4 S 4-11 '15

See also Electric conductors; Electric conduits; Electric distribution; Electric driving; Electric lines; Electric plants—Central stations; Electric power; Electric switches; Hydroelectric power; Electric switches; Hydroelectric plants

Electric transmission lines. See Electric lines

Electric trucks

lectric trucks
Battery-service system. F. B. Rae, jr. Elec
R & W Elec'n 67:454+ S 4 '15
Eighteen electric vehicles displace forty horsedrawn units. il Elec W 66:706-7 S 25 '15
Electric trucks for Boston mail service. Elec
W 66:338 Ag 14 '15
Electric vehicles for hauling lumber and cotton; for freight handling; road making and
garbage disposal. il Automobile 31:1080-1 D
10 '14

lectric vehicles in central-station il Elec R & W Elec'n 66:293 F 13'

Expansion of electric-vehicle business in Boston; mail delivery, il Elec R & W Elec'n 67: 277-8 Ag 14 '15

Increasing business with electric trucks by battery-service system. il diag Elec W 66: 195-9 Jl 24 '15

New York electric car campaign. Elec R & W Elec'n 67:970-1 N 27 '15

Operating experience with electric pole trucks at Philadelphia. il Elec W 65:1706 Je 26 '15

Opportunity for electric vehicles in mail service. Elec W 65:566-7 F 27 '15

Opportunity for the sale of electrics; specific advantages for various industries. Elec R & W Elec'n 67:703-9 O 16 '15

Performance of gas and electric trucks. W: J. Miller and S. G. Thompson. Automobile 33: 761-2 O 21 '15

Purchase and care of the initial truck. G. D. Smith. Elec R & W Elec'n 67:261-2, 264 Ag

7 '15
Saving with electric vehicles; equipment of the Curtis publishing company, il Elec W 65 1063-6 Ap 24 '15
Tests on electric trucks in mail service at Denver, Col. Elec W 66:539 S 4 '15
Twelve new commercial electrics. Automobile 32:128-9 Ja 21 '15
United States government uses many electrics il Elec R & W Elec'n 65:1212 D 26 '14
Versatility of the electric truck, il Elec W 66 481 Ag 28 '15
Wagon with two-motor concentric-gear drive

Wagon with two-motor concentric-gear drive il Elec W 65:746 Mr 20 '15

# Cost of operation

Commercial electric truck operating costs Elec W 65:567 F 27 '15 Comparisons between horse, gasoline and elec-tric delivery costs; summary of electri-vehicle study by Massachusetts institute H. F. Thomson. Elec R & W Elec'n 67:8744 H. F. T N 6 '15

Economy of the electric truck for delivering coal—unit costs compared. Elec W 66:103: N 6 '15

Garbage collection studies in Chicago justify continued use of horses. Eng Rec 72:52-3 J 10 '15

10°15
Operating cost of a five-ton electric vehicle
Elec R & W Elec'n 67:470 S 11'15
Operating cost of commercial electric vehicles
W: P. Kennedy. Elec W 65:1316-22 My 22'15
Discussion. 65:1532 Je 12'15
Operating costs of industrial electric trucks
Elec R & W Elec'n 67:872 N 6'15
Opportunity for the sale of electrics; specificadvantages for various industries. Elec R & W Elec'n 67:703-9 O 16'15
Savings through electric-vehicle operation a
Wichita, Kan. Elec W 64:1253 D 26'14

# Specifications

Specifications of 91 electric truck chassis fo 1915. Automobile 32:130-1 Ja 21 '15

Electric trucks, Municipal Electric street sprinklers. il Elec W 65:238 Ja 23 '15; Same. Eng Rec 71:117 Ja 23 '15

Electric trucks in factories, freight terminals etc.

etc.
Cost data for electric trucks in freight houses etc.
Eng Rec 71:403 Mr 27 '15
Crane-equipped storage battery truck. il Iron Age 96:1173 N 18 '15
Economy gained by handling freight with electric trucks at marine terminals. il In Marine Eng 20:124-5 Mr '15
Edwards steel trucks, il Elec R & W Elec'n 65:1231-2 D 26 '14
Electric stevedore. A. J. Marshall. il Elec F & W Elec'n 66:1084, 1086 Je 5 '15
Electric trucking at the New York termina of the Southern Pacific steamship company il Int Marine Eng 20:102 Mr '15
Electric trucks in railroad freight houses. Elec W 65:1706 Je 26 '15
Electrical appliances for workshops. il diagentical appliances for workshops. il diagentical stevedores. M. C. Horine. il Eng M 49:590-1 Jl '15
Experience with a storage battery truck. Iron Age 96:531 S 2 '15
Handling cotton with electric freight truck.

Handling cotton with electric freight trucks at Galveston, il Int Marine Eng 20:103-4 M '15

Handling freight with storage battery trucks il Ry Age 57:1093-4 D 11 '14

ennsylvania railroad's industrial trucks operating data and cost. T. V. Buckwalter il Ry Age 59:737-9 O 22 '15; Same. Ry R 57 686-9 N 27 '15; Same cond. Elec Ry J 46 864-6 O 23 '15 Pennsylvania

Storage battery truck for factory use. il Iron Age 95:1288 Je 10 '15

Electric units

Constants for converting electrical units to horsepower. C: S. Ohrenschall. Mach 21:79

Electric units—Continued
Kelvin for the unit of electric energy, W. B.
Wallis. Elec R & W Elec'n 66:171 Ja 23 '15;
Same. Power 41:172 F 2 '15

Sec also Electric symbols

Electric symbols

[lectric vehicle association of America; its influence on the present and future development of the industry. Elec R & W Elec'n 67: 697-702 O 16 '15

Papers and discussion at Cleveland, Oct. 18-19. Elec R & W Elec'n 67:764-7 O 23 '15
6th annual convention, Cleveland, Oct. 18-19. Automobile 33:760 O 21 '15
6th annual convention, Cleveland, Oct. 18-19. it Elec W 66:992-4 O 23 '15

lectric vehicle industry Battery rental systems as an aid to electric-vehicle development. Elec R & W Elec'n 67:

793-4 O 30 '15 Educational value of sociability runs. A. J. Marshall. Elec R & W Elec'n 67:458 S 4

Electric vehicle association meets. Elec R & W Elec'n 67:764-7 O 23 '15 Electric-vehicle topics discussed at San Francisco convention. Elec W 65:1649-50 Je 19

Selling the electric vehicle. il Elec R & W Elec'n 65:1131 D 12'14 Selling vehicles on the installment plan. il Elec W 66:856 O 16'15 Training dealers to sell vehicles. Elec W 65: 553 F 27'15

Electric vehicles

Chicago electric announces price reduction and battery rental system. il Elec R & W Elec'n 67:641-2+ O 2 '15
Detroit electrics lower in price, il Automobile 33:280-1 Ag 12 '15
Electric car registrations increasing, Automobile 32:127 Ja 21 '15
Electric cars, 1915 models, il Automobile 32: 132-43 Ja 21 '15
Electric vehicle operation—an actual service study. A. S. Wells, plan Elec R & W Elec'n 66:465-6+ Mr 6 '15
Electric vehicle reports, Automobile 32:85-6 Ja 14 '15

Interchangeable-battery system for electric vehicles, diags Elec W 64:1266 D 26 '14 Lightweight electric vehicle, Sci Am 112:346

Ap 10 15 Milburn electrics in three models, il Automo-bile 31:1110-11 D 17 '14 New England question box convention. Elec R & W Elec'n 66:599-600 Mr 27 '15

1916-model electric passenger cars. il Elec W 66:824-5 O 9 '15 66:824-5 O 9

Osborn electriquette; electrically propelled chair. O. E. Thomas, il Gen Elec R 18:299-300 Ap '15

Vehicle maintenance, R. Macrae, Elec R & W Elec'n 66:397 F 27 '15

See also Electric buses; Electric tractors; Electric trucks; Electric vehicle industry; Garages, Electric; Motor cars (railroad)—Storage battery; Storage batteries—Charging; Taxicabs, Electric; Wheel chairs, Electric

Control

Electric vehicle control. Elec R & W Elec'n 66:495-6 Mr 13 '15

Electric vehicles, Municipal
Use of electric vehicles in municipal service.
Elec R & W Elec'n 67:41-2 Jl 3 '15

Electric vehicles and the central station
Battery-exchange service in Boston. Elec R
& W Elec'n 67:105 Jl 17 '15

Battery-service system, F. B. Rae, jr. Elec R & W Elec'n 67:454<sub>+</sub> S 4 '15

Boosting electrics in New England. Elec W 66:448-9 Ag 28 '15

Comparative development of the commercial-power and electric-vehicle loads. Elec R & W Elec'n 67:876+ N 6 '15

Electric vehicle and the central station; abstracts. J: F. Gilchrist and A. J. Marshall. Elec R & W Elec'n 67:44, 46 Jl 3 '15; Elec W 65:1524-5 Je 12 '15

Electric vehicle as a business builder. Elec R & W Elec'n 67:710-12 O 16 '15
Electric vehicle situation in New England.
Elec W 65:803-5 Mr 27 '15
Increasing business with electric trucks by battery-service system, il diag Elec W 66: 195-9 Jl 24 '15
Opportunities for the central station in the electric-vehicle industry in 1915. J; F. Gilchrist. Elec W 66:9-10 Ja 2 '15
Review of the electric-vehicle field. W: P. Kennedy. Elec W 65:25-7 Ja 2 '15

Electric washing machines. See Washing machines, Electric

Electric water heaters

Electric immersion heater. il Elec W 66:1047

N 6 '15 Electric water heater for soda-fountain service, il Elec W 66:881 O 16 '15 Electricity for sterilizing purposes, W. B. Underwood, il Elec W 65:34 Ja 2 '15 Heat insulation of electric water heaters; abstract. A. Rittershaussen, diag Elec W 66: 651-2 S 18 '15

Electric waves

Abnormal voltages in transformers. J. M. Weed. Am Inst E E Pro 34:1621-56 Ag '15 Analytical and graphical solution for non-sinusoidal alternating currents. F. M. Mizushi. Am Inst E E Pro 34:1075-86 Je '15; Abstract. Elec W 66:8 Jl 3 '15 Analyzing electric waves for harmonics. C. W. Ricker. il Elec W 66:634-5 S 18 '15 Coolidge X-ray tube. R. Bown, il plan Elec W 65:396-7 F 13 '15 Direct-reading instrument for measuring the logarithmic decrement and wave length of electromagnetic waves. F: A. Kolster. il diags U S Bur Stand Bul 11:421-55 My 10 '15

Discussion on irregular wave shapes. (See Proceedings for June, 1915) Am Inst E E Pro 34:3087-3116 D '15
Distortion factors. F: Bedell, R. Bown and C. L. Swisher. Am Inst E E Pro 34:1059-73
Je '15: Abstract. Elec W 66:7-8 JI 3 '15
Distortion of alternating current wave caused by cyclic variation in resistance. F: Bedell and E. C. Mayer. diags Am Inst E E Pro 34: 177-86 F '15: Discussion. 34:2584-9 O '15
Effect of transient voltages on dielectrics. F. W. Peek, jr. il Am Inst E E Pro 34:1695-1747 Ag '15

F. W. Peek, jr. il Am Inst E E Pro 34:1695-1747 Ag '15
Electric waves and oscillations; means of investigating the interior of the earth.
G. Leimbach. Sci Am S 79:154-5 Mr 6 '15
Form factor and its significance. F: Bedell, R.
Bown and H. A. Pidgeon. Am Inst E E Pro 34:1051-8 Je '15; Abstract. Elec W 66:7 Jl 2 '15

Function of the earth in radio-telegraphy. J. A. Fleming. Sci Am S 79:29 Ja 9 '15

Harmonics in transformer magnetizing currents. J. F. Peters. diags Am Inst E E Pro 34:1657-73 Ag '15

Magnetic behaviour of iron under alternating magnetization of sinusoidal waveform. N. W. McLachlan. diags Inst E E J 53:809-19 Je 15

Mathematical relationship between flux and magnetizing-current waves at high flux densities. A. L. Tackley. Inst E E J 53:521-5 Ap 1 '15 5 Ap 1

Production of damped oscillations, L. O. Heath, diags Gen Elec R 18:1110-17 D '15

Scientific work of Prof. J. C. Bose, J. Kunz. Sci Am S 79:291 My 8 '15

Theory of electric waves in transmission lines.
J. M. Weed, diags Gen Elec R 18:1148-53 D

Velocity of Hertzian waves. H. E. Saunders. diags Sci Am S 80:21-2 Jl 10 '15

See also Electric currents, Alternating; Wireless telegraph

Electric welding

Answers to some questions on electric arc welding, J. F. Lincoln, Am Inst E E Pro 31:433-8 Mr '15; Same, Iron Tr R 56:623-4 Mr 25 '15; Same cond. Ry Age (Mech ed) 89:195 Ap '15; Discussion, Am Inst E E Pro 34:2941-6 D '15

Electric welding—Continued

Arc welding and its application in the metalworking industry. J. F. Lincoln. Elec R & W
Elec'n 66:1161-2 Je 19 '15; Same cond.
Foundry 43:139-40 Ap '15; Excerpts. Iron
Age 95:949 Ap 29 '15

Autoratically worlded electric icints in Brook-

Automatically welded electric joints in Brook-lyn, il Elec Ry J 44:1310 D 12 '14 British chain welder, il Iron Tr R 57:272 Ag 5

Compact arc-welding outfit. il Elec Ry J 46:

Compact arc-welding outfit. il Elec Ry J 46: 195 Jl 31 '15
Constant current electric welder. il Ry Age (Mech ed) 89:490 S'15
Costs of electric-arc welding. G. W. Cravens. Eng N 73:1084 Je 3 '15
Electric-arc welding. il Eng & Min J 99:947-8
My 29 '15; Same. Power 42:27 Jl 6 '15
Electric butt-welding practice. D. T. Hamilton. diags Mach 21:562-5, 660-3, 735-9 Mr-My '15
Electric process for safe-ending tubes. L. R. Electric process for safe-ending tubes. L. R. Pomeroy. diags Ry Age (Mech ed) 89:469-70

Pomeroy. diags Ry Age (Mech ed) 63:465-19 S '15
Electric welding. G. Fox. il diags Elec R & W
Elec'n 67:117-19, 156-9, 204-6 Jl 17-31 '15
Electric welding costs. J. H. Bryan. Ry R 56:
187 F 6 '15
Electric welding in boiler maintenance; report
of committee of Master boiler makers' association. Ry Age (Mech ed) 89:312-13 Je '15;
Same. Ry Age 58:1166-7 Je 4 '15
Electric welding outfit of new design. il Iron
Tr R 57:264 Ag 5 '15
Electric welding with dynamotor sets. D. Durie. Elec Ry J 46:324 Ag 21 '15
Folding box to guard the public eye against
welding. R. P. Williams. il Elec Ry J 45:
847-8 My 1 '15
How a water-tube boiler was repaired by an
electric weld. A. C. Lasher. Elec W 66:1207-8
N 27 '15
Master blacksmiths' convention; discussion of

Master blacksmiths' convention; discussion of electric welding, il diags Ry Age (Mech ed) 89:476-80 S '15

89:476-80 S 15
Modern methods of electric welding and their application. H. S. Marquand, diags Inst E E J 53:851-6 Je 15 '15
Modern practice in electrical arc welding. J: A. Randolph. il Foundry 43:316-17 Ag '15; Same. Iron Tr R 57:490-1 S 9 '15
Proposition electric welding. D. T. Hamilton

Percussive electric welding. D. T. Hamilton. il diags Mach 21:807-12 Je '15
Power-driven spot welding machine. il Iron Age 96:85 Jl 8 '15
Restoring steel wheel flanges with a welder. F. A. Murphy, il Elec Ry J 45:719-20 Ap 10

Seventy years of inventions. il Sci Am 112: 518-19 Je 5 '15

Thomson electric welding patents upheld. Elec W 66:851-2 O 16 '15

Three new welding machines, by Agnew electric welder co., Detroit, Mich. il Iron Age 95:787 Ap 8 '15

Toledo butt and spot welders. il Mach 21:673-4 Ap '15; Elec W 65:952 Ap 10 '15 Welding shafts on special machine. il Iron Tr R 56:681 Ap 1 '15; Iron Age 95:736-7 Ap 1

Electric wire and wiring American and foreign wiring rules. Elec W 64:

1083 D 5 '14

American and toreign wiring rules, Elec W 64:
1083 D 5 '14

American versus continental wiring standards. H. K. Richardson. Elec W 65:1157 My
8 '15

Bare concentric wire. R. S. Hale. Elec W 65:

570-2 F 27 15. Changes in National electrical code. Elec W 65:878-80 Ap 3 '15 Cheap house wiring. Elec W 65:204 Ja 23 '15

Cheap wiring methods discussed. Elec W 64: 1235 D 26 '14

Cheaper electric wiring and the manufacturers of standard wiring devices. Elec R & W Elec'n 65:1201-2 D 26'14

Cheaper house wiring: description of the bare concentric wire. W. H. Blood, jr. Elec W 64: 1134 D 12 '14

Cheaper wiring. G: Weiderman; J: A. Cava-naugh. Elec R & W Elec'n 66:81 Ja 9 '15

Cheaper wiring. W. W. Lewin. Elec W 65:716 Mr 20 '15

Cheaper wiring: views of authorities in England. Elec R & W Elec'n 66:242-4, 294-5 F land. E 6-13 '15

6-13 '15 Concentric wire for interior lighting circuits. il Elec W 65:177 Ja 16 '15 Concentric wire; one of the hazards. C. W. Abbott. Elec R & W Elec'n 66:353 F 20 '15; Same. Elec W 65:716-17 Mr 20 '15 Concentric wiring. C: Wirt. Elec W 65:77-8

Ja 9 '15

Ja 9 '15 Concentric wiring. G. W. Borst. Elec W 65: 516 F 27 '15 Concentric wiring. L. Dolkart. Elec R & W Elec'n 66:545 Mr 20 '15 Concentric wiring; abstract. D. S. Munro. il Elec W 66:411 Ag 21 '15 Concentric wiring discussed. Elec W 66:445-6 Ag 28 '15 Concentric wiring: discussion by electrical in

Concentric wiring discussed. Elec W 66:445-6 Ag 28 '15
Concentric wiring; discussion by electrical interests. Elec W 65:185-6 Ja 16 '15
Concentric wiring in Great Britain. A. H. Seabrook, il Elec W 65:1156-7 My 8 '15
Concentric wiring; possible dangers. R. B. Benjamin. Elec W 65:389-90 F 13 '15
Concentric wiring; report by committee of National fire protection association. Elec R & W Elec'n 66:244 F 6 '15
Concentric wiring: report of special committee of electrical interests. Elec R & W Elec'n 66:112-14 Ja 16 '15
Concentric-wiring rules; preliminary draft. Elec W 65:365-6 F 6 '15
Conduit installation in gas-engine factory; plant of Woodward motor company. il Elec R & W Elec'n 66:583-4 Mr 27 '15
Connector for electric wires. il Elec W 66:996
O 30 '15
Cutting hole in plaster wall for distribution cabinet. A. Gorman. il Elec W 66:208 Jl 24 '15

'15
Elaborate temporary wiring installation; provisions for electric illumination of the outdoor performance of Siegfried given in the Harvard stadium at Cambridge, Mass. il Elec W 66:474-5 Ag 28 '15
Electric wiring, G: C. Shaad. Elec W 65:1067-8, 1326-7 Ap 24, My 22 '15
Electric wiring in new Bureau of engraving and printing, Washington, D. C. E. C. Stanton. il plan Elec W 66:686-8, 744-6 S 25-O 2 '15

Electrical equipment rules. Colliery

Electrical equipment rules. Colliery 35:678+Jl '15
Electrical manufacturers discuss cheaper wiring. Elec R & W Elec'n 65:1226-7 D 26 '14
Evolution of concentric wiring. S. E. Doane. Elec R & W Elec'n 66:489-90 Mr 13 '15; Same. Elec W 65:696-7 Mr 13 '15
Feeder protective system. il diags Elec W 65: 991-2 Ap 17 '15
First installation of bare concentric wiring in America. il Elec W 66:796-8 O 9 '15
German copper reserves in electric circuits. F. Loppé. Eng M 50:117 O '15
Houses wired with concentric system in Boston. Elec R & W Elec'n 67:666 O 9 '15
Installation of motors. M. F. Arloe. diags Elec R & W Elec'n 67:558-63 S 25 '15
Interior wiring for lighting and power service. A. L. Cook. Power 41:601-5, 640-3, 666-71, 702-6, 736-8 My 4-Je 1 '15
Interior wiring for lighting and power service. A. L. Cook. Power 41:601-5, 640-3, 666-71, 702-6, 736-8 My 4-Je 1 '15
Interior wiring rules compared: an outline of the regulations followed in the United States, Germany and England. Elec W 64: 1099-1108 D 5 '14
Jumpers prevent service interruptions. il Elec W 66:590 S 11 '15
Master-switch lighting circuits. V. N. Heath. diags Elec W 65:811-13 Mr 27 '15
Meeting of N. E. L. A. wiring committee. Elec W 65:697-8 Mlr 13 '15
Meeting of N. E. L. A. wiring committee. Elec W 65:697-8 Mlr 13 '15
Method of breaking off tubes. A. Gorman. diags Elec W 65:1707 Je 26 '15
Modern methods of electrical wiring; abstract. D. S. Munro. Elec W 65:789 Mr 27 '15
N. E. L. A. committee report on the wiring of existing buildings. Elec W 65:1523-4 Je 12 '15
National electrical code amended at conference in New York city. Elec R & W Elec'n 66:624-8 Ap 3 '15
National electrical code wiring rules compared with the German and English rules, Elec R & W Elec'n 65:1081-9 D 5 '14

Electric wire and wiring—Continued
Opposition to overhead wiring rules of Idaho
public utility commission. Elec W 64:1184-5 public u D 19 '14

D 19 '14
Pagrip metal molding and fittings therefor, il
Elec R & W Elec'n 66:736-7 Ap 24 '15
Permanent and effective grounding of concentric wire. C. W. Abbott. Elec R & W
Elec'n 66:446-7 Mr 6 '15
Precautions to be observed in inserting cartridge fuses. T. H. Reardon. diags Elec R
& W Elec'n 66:683-4 Ap 10 '15
Proposed system of wiring. R. B. Benjamin.
Elec R & W Elec'n 66:353-4 F 20 '15
Questions and answers on the National electrical code. Published in the Electrical review and western electrician
Resistance wires. R. F. Hunt. Metal Ind n s
13:420-1 O '15

view and western electrician Resistance wires. R. F. Hunt. Metal Ind n s 13:420-1 O'15
Running conductors to side outlets in finished-building wiring. T. Croft. diags Elec R & W Elec'n 65:1213-15 D 26'14
Safer and cheaper wiring systems. W. H. Blood, jr. Elec W 65:76 Ja 9'15
Skin effect in bimetallic wires. J: M. Miller. Elec W 65:1612-13 Je 19'15
Small lighting consumer. J. R. Cravath. Elec W 65:148-9 Ja 16'15
Solving the difficulty of galvanic action between steel and copper spans. Elec W 65:610 Mr 6'15
Specification form for residence wiring. Elec R & W Elec'n 66:1194-6 Je 26'15
Standardization of plugs and receptacles. il Elec W 65:657-8 F 27'15
Status of bare concentric wire. Elec W 66: 1181-2 N 27'15
Substitutes for copper in Germany. Elec W 66: 1040 N 6'15
Substitutes for copper wires in Germany.

Substitution of iron for copper wires in Germany; abstract. G. Dettmar. Elec W 65:218

Ja 23 '15

Temperature rise in twin flexible wires. S. W. Melsom and H. C. Booth. diags Inst E E J 53:21-9 D 1 '14 Underwriters passive on concentric wiring and refillable fuses. Elec W 65:821 Wr 27 '15

enderwriters passive on concentric wiring and refillable fuses. Elec W 65:821 Wr 27 '15 Wiring an old frame building at \$3 an outlet. il diag plans Elec W 65:240-3 Ja 23 '15 Wiring and conduit work at the Panama-Pacific exposition. A. A. Willoughby. il diags Elec R & W Elec'n 67:365-8, 432-5, 472-4 Ag 28-S 11 '15

Wiring for colliery electric lighting; abstract. G. S. Corlett. Elec W 65:1426 My 29 '15 Wiring layout for auxiliaries at Cleveland municipal plant. A. D. Williams. plan Power 42: 296-7 Ag 31 '15

See also Electric cables; Electric conductors; Electric conduits; Electric distribution; Electric inspection; Electric lighting; Electric lires; Electric railroads—Wiring; Electric transmission; Insulation; Trolley wire

# Cost

Cost of wiring and conduit work. Elec R & W Elec'n 66:585 Mr 27 '15
Labor costs in interior construction. L: W. Moxey, jr. Elec W 66:924-7 O 23 '15
Lynn house-wiring campaign; schedule of prices. il Elec W 66:539-40 S 4 '15

# Terminology

Electric wire and cable terminology, il U S Bur Stand Circ 37:1-13 '15

# Testing

Voltage and insulation-resistance tests for wires of various sizes, Elec W 65:1050 Ap 24 '15

ctrical and gas association, Southwestern. See Southwestern electrical and gas associa-Electrical tion

Electrical code, National. See National electrical code

Electrical contractors' association of the state of Illinois

Semi-annual convention, Chicago, Jan. 15 and 16. Elec R & W Elec'n 66:154 Ja 23 '15

Electrical contractors' association of Wisconsin 12th annual meeting. Elec R & W Elec'n 66: 152-3 Ja 23 '15

Electrical development, Society for: See Society electrical development

Electrical engineers, American institute of. See American institute of electrical engineers Electrical inspectors, National association of. See National association of electrical in-

spectors

Electrical propulsion. See Ship propulsion, Electric

Electrical prosperity week

Arrangements for celebration. Elec W 66:11656 N 20 '15

6 N 20 <sup>15</sup> Campaign. il Elec W 66:216, 508-9 Jl 24, S 4 <sup>15</sup> Celebration features of electrical prosperity week unique and interesting. Elec R & W Elec'n 67:981-2 N 27 <sup>15</sup> Denver company conducts strenuous prosperity week campaign. Elec R & W Elec'n 67:970 N

27.15
Developments in plans for nation-wide celebration. Elec W 66:795 O 9'15
Electrical prosperity week districts. map Elec W 65:1649 Je 19'15
Electrical prosperity week—its mission—and how you can profit. il map Elec R & W Elec'n 67:329-34 N 6'15
Meeting of the advisory committee. Elec R & W Elec'n 67:120 Jl 17'15
National electrical week. S. M. Kennedy. Elec W 65:588-9 Mr 6'15
Plans. Elec R & W Elec'n 67:163 Jl 24'15
Sectional committees. Elec W 65:1570-1 Je 12'15

Suggested national electrical week. Elec W 65:

Suggested national electrical week. Elec W 65: 183, 276-8 Ja 16, 30 '15
Suggestion advanced for a national electrical week. Elec R & W Elec'n 66:170 Ja 23 '15
What the dealer and the contractor can do to cash in on electrical prosperity week. Elec R & W Elec'n 67:797-800 O 30 '15
Your program for electrical prosperity week. E. E. Whitehorne. il Elec W 66:515-18 S 4 '15

Electrical safety code, National. See National electrical safety code Electrical supplies, Associated manufacturers of, See Associated manufacturers of electrical

supplies

Electrical supply jobbers' association
History and list of members. Elec R & W
Elec'n 66:523-4 Mr 20 '15
Summer meeting, Niagara Falls, Sept. 14-16.
Elec W 66:623 S 18 '15

Electricians Electrician's registration bill becomes law in Massachusetts. Elec R & W Elec'n 66:1151-2 Je 19 '15

Je 19 '15 Examination of electricians in Massachusetts. Elec R & W Elec'n 67:364 Ag 28 '15 Massachusetts electricians' licensing bill. Elec W 65:1575 Je 12 '15 Rules of New York city board for licensing electricians, Elec R & W Elec'n 67:606 O 2 '15

Electricity Analogies between electricity and mechanics. W. S. Franklin. Met & Chem Eng 13:317 My

'15 r. Edward Weston's achievements in the field of electricity. C. Hering. J Ind & Eng Chem 7:253-4 Mr '15 Chem 7:253-4 Grain: abstract. G. C. Simpson.

Chem 7:253-4 Mr '15
Electricity of rain; abstract. G. C. Simpson.
Elec W 66:251 Jl 31 '15
Future possibilities of electricity. C. Hering.
Sci Am 113:490+ D 4 '15
Recent researches in electricity at the Bureau of standards. E. B. Rosa, il plan J Fr
Inst 180:539-59 N '15
Static electricity in a textile mill. W: T. Estlick, il Elec R & W Elec'n 67:231 Ag 7 '15

See also Armatures; Contact electricity; Dynamos; Electrons; Induction coils; Insulation; Ionization of gases; Ions; Lightning; Magnetism; Radioactivity; Telegraph; Telephone; Telpherage; Wireless telegraph; Xrays; also headings beginning Electric and

#### Terminology

Standardization rules of the American institute of electrical engineers; approved by the board of directors, June 30th, 1915, to take effect July 1, 1915. Am Inst E E Pro 34:1933-2041 Ag '15

See also Electric symbols; Electric units; Electric wire and wiring—Terminology

Electricity, Sale of. See Electric service companies

Electricity, Solar

Attempt to measure the free electricity in the sun's atmosphere. G: E. Hale and H. D. Babcock. Sci Am 113:183 Ag 28 '15

Electricity in agriculture. See Electricity on the

Electricity in bakeries 1800 pies an hour: electrically operated ma-chine. il Elec W 65:419 F 13'15 Electricity in bakeries. il Elec R & W Elec'n 66:715-21 Ap 17'15

Electricity in construction work
Diesel engine for the contractor—why not?
H. D. Hammond. il Eng Rec 71:409-10 Mr 27

Electricity in Boston Tech building construc-tion, il Elec W 65:1068-9 Ap 24 '15

Electricity in foundries

Economics of motor drive. H. F. Stratton. Iron Tr R 55:527-30+ S 17 '14; Same cond. Elec R & W Elec'n 65:827-8 O 24 '14; Abstract. Ind Eng 14:403-6 O '14 Electrical construction in machine shops and

Electrical construction in machine shops and foundries. N. G. Meade, diags Elec R & W Elec'n 67:16-18 Jl 3'15
Industrial control in the foundry. R. H. Mc-Lain. il Am Inst E E Pro 34:587-97 Ap '15; Same. Foundry 48:201-3 My '15; Abstract, with discussion. Elec R & W Elec'n 66:777-8 Ap 24 '15; Discussion. Am Inst E E Pro 34:294-96 D '15
Selection of electric motors and controllers.

election of electric motors and co S. H. Libby. Foundry 43:60-3 F '15

See also Electric furnaces

Electricity in horticulture. See Electrohorticul-

Electricity in mining Central-station power in coal-mining opera-tions. T: R. Hay. il Eng M 48:833-48 Mr

Electrical developments in mining in 1914. il Eng & Min J 99:277-8 F 6 '15 Electrical equipment rules. Colliery 35:678+

Electricity applied to mining. C: P. Sparks. diags plans Inst E E J 53:389-430; Discus-sion. 53:430-8, 649-76 Mr 15, My 1 '15 Electricity in a coal-handling plant. R. M. Hale. il Elec R & W Elec'n 65:1165-8 D 19

Electricity in mining service. Elec W 65:1226 My 15 '15 My 15 '15 Energy supply on the Rand; abstract. B. Price. Elec W 65:1683-4 Je 26 '15

Energy supply on the Rand; abstract, B. Price. Elec W 65:1683-4 Je 26 '15

Explosion-proof apparatus. W. Baum. Am Inst E E Pro 34:2686-6 N '15

Influence of inflammable mine gas upon the design of motors for mine service. H. H. Clark. Am Inst E E Pro 34:2686-9 N '15

Large electric hoist for Montana mine. Elec R & W Elec'n 67:943-4 N 20 '15

Mine motors, with special reference to electric motors. E. Drennen. Colliery 35:241-5 D '14

Mining loads for central stations. W. Sykes and G. Bright. Colliery 35:477-9 Ap '15

Operations in the New River field. W: Z. Price. il Colliery 35:533-4 My '15

Permissible explosion-proof electric motors for mines: conditions and requirements for test and approval. H. H. Clark. il U S Bur Mines Tech Pa 101:1-14 '15

Power supply of the Central mining-Rand mines group. J. H. Rider, il diags Inst E E J 53:609-32; Discussion. 53:633-40, 736-43, 838-43 My '1-15, Je 15 '15

Safe use of electricity in coal mining. W. M. Thornton. Sci Am S 78:398-400 D 19 '14

Shot firing in coal mines by electric circuit from the surface. G: S. Rice and H. H. Clark. Am Inst Min E Bul 94:2563-71 O '14; Discussion. 100:NN-3-14 Ap '15.

Tom Hunter, hoisting engineer. W. O. Rogers. il Power 40:16-18, 188-90, 922-4 Jl 7, Ag 4, D 29 '14

Tramming and hoisting at Copper Queen mine. G. F. G. Sherman, il diags.

Tramming and hoisting at Copper Queen mine. G. F. G. Sherman, il diags Am Inst Min E G. F. G. Sherman. il Bul 105:1837-85 S '15

2400-volt railway of the Bethlehem-Chile iron mines company, E. E. Kimball, Gen Elec R 18:12-14 Ja '15

Use of electricity in mining work. D: B. Rushmore. il Gen Elec R 18:527-39 Je '15

See also Locomotives, Mine; Mining engineering; Mining machinery

Recring; Mining machinery
Electricity in refrigeration
Artificial ice plants operating in conjunction
with small central stations. H. Hecheimer.
Elec R & W Elec'n 65:1168-9 D 19'14
Electricity in a cold-storage plant. il Elec R
& W Elec'n 67:357-9 Ag 28'15
Making ice with purchased electric power.
C: A. Tripp. il Munic Eng 48:294-6 My'15

Electricity in the automobile industry
Electricity in the automobile industry. F. M.
Kimball. Gen Elec R 18:550-2 Je '15

Kimball. Gen Elec R 18:550-2 Je '15

Electricity in the home
Chimneyless electrical suburb near Glasgow,
Scotland. il Elec W 66:970 O 30 '15

Domestic uses of electricity around Boston.
il Elec W 66:988-70 O 30 '15

Electric heating and heating appliances. C. P.
Randolph. il Gen Elec R 18:523-6 Je '15

Electrical contractor who practices what he
preaches. il Elec R & W Elec'n 67:431 S 4 '15

Electricity in the modern nursery. il Elec W
66:990 O 30 '15

Electricity on a country estate. il Elec W 66:
476-8 Ag 28 '15

Home electrical at the Panama-Pacific international exposition. D. C. Shafer. il plan
Gen Elec R 18:572-8 Je '15; Same cond. Elec
R & W Elec'n 66:1041-3 Je 5 '15

What the customer wants to know concerning
the cost of using appliances. Elec W 66:980-1
O 30 '15

See also Electric bells: Electric cooking:

See also Electric bells; Electric cooking; Electric heating; Electric stoves; Electric toasters; Electric water heaters; Washing machines, Electric

Electricity in war
Electricity in present-day warfare, il Sci Am
113:494+ D 4 '15

Electricity on ships
Application of electricity in naval warfare.
H. L. Hibbard. il Siblev J 29:251-61 My'15
Electric heating as applied to marine service.
C. S. McDowell and D. M. Mahood. Am
Inst E E Pro 33:861-72 Je'14; Discussion.
33:1891-5 D'14
Electrical equipment of a battleship. H. A.
Hornor. Elec R. & W Elec'n 66:671-2 Ap 10

Electricity on board ship: Le Rullard. Int Marine Eng 20:63-4 F '15 Electricity on board ship: Le Rullard. Int Marine Eng 20:63-4 F '15 Electricity on board ship: J. E. Bullard. Int Marine Eng 20:63-4 F '15 Electricity on beard ship: Le Rullard. Int Marine Eng 20:63-65 Electricity on board ship: Le Rullard. Int Marine Eng 20:63-65 Electricity on board ship: Le Rullard. Int Marine Eng 20:63-65 Electricity on board ship: Le Rullard. Int Electricity on board ship: Le Rullard. Int Electricity on board ship: Le Rullard. Int Electricity on board ship: Lectricity on board ship: Lectricity on board ship: Lectricity on Lectric Electricity on Lectric Electricity on Lectric Electricity on Lectric Electricity on Lectric Electric Elect

Latest developments in marine electrical en-gineering. H. A. Hornor. Int Marine Eng 20: 201-3 My '15 Scottish local section; chairman's address.

cottish local section; chairman's address. J. Lowson, Inst E E J 53:37-42 D 1 '14

Standard marine electrical installations, H. A. Hornor, il diags Am Inst E E Pro 34:1515-48 15 Ag

Use of electricity in ships. Sci Am S 80:39 J1 17 '15

See also Ship propulsion, Electric

Electricity on the farm Analysis of central-station practice in Wis consin regarding rural service. Elec R & W Elec'n 66:237-9 F 6 '15

Application of electricity to agriculture. il Engineer 119:260-1 Mr 12 '15

Electric service on the f Elec'n 67:178-9 Jl 31 '15 farm. Elec R & W

Electricity in agriculture, C. J. Rohrer, il Gen Elec R 18:483-96 Je '15; Same, Sci Am S 80; 264-6, 278-9 O 23-30 '15

Electricity in rural districts: threshing in an Iowa community. il Elec R & W Elec'n 66: 148-9 Ja 23 '15

See also Electrohorticulture

Electricity supply
Centralization of London energy supply. Elec
W 64:1137 D 12 '14
Supply of the Netherlands with electric energy.
Elec R & W Elec'n 67:30 J1 3 '15

Electrification of railroads. See Railroads-Electrification

Electriquettes

Osborn electriquette; electrically propelled chair. O. E. Thomas, il Gen Elec R 18:299-300 Ap '15

Electrocardiograph

Instrumental study of the heart, il Sci Am 112:630-1+ Je 26 '15

Electrochemical society, American. See American electrochemical society

Electrochemistry

electrochemistry
American electrochemical society, San Francisco meeting, Sept. 16-17. Elec R & W Elec'n 67:625-8 O 2 '15
American electrochemical society, 27th general meeting. Elec R & W Elec'n 66:821-4

My 1 '15

American electrochemical society, 27th general meeting, Elec W 65:1108-10 My 1 '15

American electrochemical society, 27th general meeting, Atlantic City. Met & Chem Eng 13:314-29 My '15

Contributions of the chemist to the electrochemical industry, W. S. Landis. J Ind & Eng Chem 7:944 N '15

Edward Weston's inventions. L. H. Baekeland. por Sci Am S 79:108-9 F 13 '15

Electric synthesis of colloids. J. Mukhopâdhyâya. Am Chem Soc J 37:292-7 F '15

Electrochemical production of organic compounds. Met & Chem Eng 13:1-13 Ap '15

Electrochemistry in America. Met & Chem Eng 13:1-3 Ja '15

Electrochemistry in 1914. E. F. Roeber. Elec

Eng 13:1-3 Ja '15
Electrochemistry in 1914. E. F. Roeber. Elec
W 65:24-5 Ja 2 '15
Measurement of oxidation potentials at mercury electrodes: the stannic-stannous potential. G: S. Forbes and E: P. Bartlett. Am
Chem Soc J 36:2030-40 O '14
Potential of silver against silver ion in concentrated solutions of potassium and of
sodium chloride, and its relation to the activities of such solutions. G: S. Forbes and
F: O. Anderegg. Am Chem Soc J 37:1676-85
JI '15

Studies of a new kind of e. m. f. R. Beutner. diags Am Chem Soc J 36:2040-59 O '14 Year in the electrical industry. Elec R & W Elec'n 66:7 Ja 2 '15

See also Chemistry, Physical; Dissociation; Electric batteries; Electric furnaces; Elec-trolysis; Electrolytes; Electrometallurgy; Ions; Passivity

Electroculture of plants. See Electrohorticulture

Electrodes

Charged surface layers formed on the electrodes of vacuum tubes; abstract. K. T. Compton and L. W. Ross. Elec W 66:1210 N

Design, construction, and operation of electric furnaces. D. A. Lyon and J. F. Cullen. diags U S Bur Mines Bul 77:41-71 '14

Electric furnace electrodes-their manufacture and use. C: A. Barnett. il diags Sibley J 30:27-32 O '15

Ferro-ilmenite arc on alternating-current circuits. I. Ladoff. Elec R & W Elec'n 66:871-2 My 8 '15

Influence of the potassium ion upon the potential of the ferrocyanide-ferricyanide electrode; abstract. E. P. Schoch and W. A. Felsing. Met & Chem Eng 13:568-9 S 1 '15

Measurement of oxidation potentials at mer-cury electrodes: the stannic-stannous poten-tial. G: S. Forbes and E: P. Bartlett. Am Chem Soc J 36:2030-40 O '14

Potential of silver against silver ion in concentrated solutions of potassium and of sodium chloride, and its relation to the activities of such solutions. G: S. Forbes and F: O. Anderegg. Am Chem Soc J 37:1676-85 JI '15

Potential of the rubidium electrode. G. N. Lewis and W. L. Argo. diag Am Chem Soc J 37:1983-90 S '15

Reproducibility of the cadmium electrode. F. H. Getman and V. L. Gibbons, il Am Chem Soc J 37:953-70 My '15

Electrodynamometer

Weston portable electrodynamometer instru-ments, il Int Marine Eng 20:523 N '15; Elec Ry J 46:837 O 16 '15

Electro-filtros

Improved diaphragm material—electro-filtros. C. J. Thatcher. Met & Chem Eng 13:336-8 My '15

Electrogalvanizing. See Galvanizing

Electrograph

Electric talking sign. Elec R & W Elec'n 66: 1067 Je 5 '15

Electrohorticulture

Electro-culture: a resumé of the literature. H. R. Hosmer. Gen Elec R 18:14-21 Ja '15; Same. Sci Am S 79:258-9 Ap 24 '15 Electro-culture of the soil. Sci Am S 79:151 Mr 6 '15

Electrolysis

Action of certain colloids on ions during elec-

Action of certain colloids on ions during electrolysis. A. Mutscheller, diags Met & Chem Eng 13:353-7 le '15
Adjustment of the direct electric lighting current to electro-analysis. E. J. Kauffman, plan Met & Chem Eng 13:524-5 S 1 '15
Alternating current electrolysis. J. C. Ghosh, diags Am Chem Soc J 36:2333-46 N '14
Anhydrous hydrazine; electrolysis of a solution of sodium hydrazide in anhydrous hydrazine, T. W. B. Welsh, diag Am Chem Soc J 37:497-508 Mr '15
Battery assay of copper: report of subcommittee. J Ind & Eng Chem 7:546-7 Je '15
Coagulation of albumin by electrolytes. W. D. Bancroft, Met & Chem Eng 13:317-18 My '15
Copper leaching; discussion. L. D. Ricketts, and others. Met & Chem Eng 13:319-24 My '15

Electro-analysis of the second group metals; abstract. E. P. Schoch and D. J. Brown. Eng & Min J 100:521 S 25 '15; Same. Met & Chem Eng 13:568 S 1 '15
Electrolysis of copper sulphate liquors, using carbon anodes. L. Addicks. il diag Met & Chem Eng 13:748-55 O 15 '15
Electrolysis of solutions of the rare earths. L. M. Dennis and B. J. Lemon. Am Chem Soc J 37:131-7 Ja '15
Electrolysis of solutions of the rare earths. L. M. Dennis and P. A. Van der Meulen. Am Chem Soc J 37:1963-76-S '15
Electrolytic cell patents for the production of caustic soda and chlorine. diags Met & Chem Eng 13:815-16 N 1 '15
Electrolytic endosmose. H. G. Byers and C. H.

Electrolytic endosmose, H. G. Byers and C. H. Walter, diags Am Chem Soc J 36:2284-91 N

Electrolytic method of sewage disposal. J. C. Olsen, il Met & Chem Eng 13:735-9, 793-7 O 15-N 1 '15

Electrolytic precipitation of gold, silver and copper from cyanide solutions. G. H. Cleven-ger, diags Met & Chem Eng 13:803-6, 852-60 N 1-15 '15

Electrolytic production of caustic and chlorine.
diag Met & Chem Eng 13:506 Ag '15

Electrolytic production of oxygen and hydro-gen—a typical plant, il Elec R & W Elec'n 66:1170-1 Je 19 '15

Electrolytic separation of zinc, copper and iron from arsenic. A. K. Balls and C. C. McDon-nell. J Ind & Eng Chem 7:26-9 Ja '15

Gold precipitation on paper. D. Lay. Eng & Min J 100:276-7 Ag 14 '15

Influence of an alternating current on electrolysis by a direct current. J. C. Ghosh. diags Am Chem Soc J 37:733-52 Ap '15

Motion pictures of electrolysis, il Sci Am S 80:340-1 N 27 '15

Revision of the atomic weight of cadmium: the electrolytic determination of cadmium in cadmium chloride. G. P. Baxter and M. L: Hartmann. Am Chem Soc J 37:113-31 Ja '15

Use of hydrofluoric acid in the separation of copper and lead from tin and antimony by means of the electric current. L. W. McCay. Am Chem Soc J 36:2375-81 N '14

Electrolysis-Continued

Zinc extraction by electrolysis. E. H. Leslie. Eng M 48:910-12 Mr '15

See also Electrochemistry; Electrodes; Electrolytes; Electrolytic corrosion; Electrometallurgy

Electrolytes

Coagulation of arsenious sulfide sol by electrolytes. J. Mukhopadhyaya. Am Chem Soc J 37:2024-31 S '15

J 37:2024-31 S '15
Conductivity and viscosity of solutions of electrolytes in formamid. P. B. Davis, W. S. Putnam and H. C. Jones. Il diags J Fr Inst 180:567-601 N '15
Distribution of an electrolyte between water and some second solvent and its dissociation constant in aqueous solution. H: J. M. Creighton. J Fr Inst 180:63-74 JI '15
Improved diaphragm material—electro-filtros. C. J. Thatcher. Met & Chem Eng 13:336-8 Wy '15

C. J. 7 My '15

G. J. Thatcher. Met & Chem Eng 13:336-8 May '15
Measurement of the conductivity of electrolytes; abstract. W. A. Taylor and H. L. Curtis. Elec W 66:187 Jl 24 '15
Method for the calculation of the hydration of the ions at infinite dilution, and the ideal diffusion coefficient as applied to the hydrodiffusion of electrolytes. G: M. Smith. Am Chem Soc J 37:722-33 Ap '15
Relative migration velocities of the ions in complex electrolytes. A. Mutscheller. Met & Chem Eng 13:439-42 Jl '15
Sensitive criterion of the precision and of constant errors in the conductance data of weak electrolytes, the determination of the molar conductance of organic electrolytes at zero concentration and a study of the correction for the specific conductance of the conductivity of water. C. G. Derick. Am Chem Soc J 36:2268-83 N '14
Solution stratification as an aid in the purification of electrolytes. F. R. Pyne, diag Met & Chem Eng 13:895-6 D 1 '15

See also Electric batteries; Electrochemistry; Electrodes; Electrolysis; Ions; Storage batteries

batteries

Electrolytic corrosion

Causes of corrosion of water pipes and other underground structures. W. W. Cole. Elec Ry J 45:186 Ja 23 '15
Corrosion of metals in natural soils. E. H. Scofield and L. A. Stenger. il Elec Ry J 44: 1092-5 N 14 '14; Same cond. Eng M 48:588-91 Ja '15; Discussion. Elec Ry J 45:419-21 F 27 '15

Earth resistance and its relation to the electrolysis of underground structures. B. Mc-Collum and K. H. Logan. J Fr Inst 180:614-15 N '15

Effects of electrolysis on engineering structures. A. F. Ganz. Elec Ry J 46:624-5 S 25

Electrolysis—its detection and mitigation. B. McCollum. Elec R & W Elec'n 66:259-60

Electrolysis mitigation, Am Gas Light J 103:  $129-30~\mathrm{Ag}$  30 '15

Electrolysis mitigation. Am Gas Light J 103: 268 O 25 '15

Electrolysis mitigation in Springfield and New Elyria, Ohio. Elec R & W Elec'n 67:435 S 4

lectrolysis of reinforced concrete. Am Gas Light J 101:364 D 7 '14 Electrolysis

Electrolytic action of return currents. H. E: Yerbury. Engineer 119:254 Mr 12 '15 Electrolytic corrosion in pipes. Metal Work 84:302 S 3 '15

Electrolytic corrosion of iron in soils, B. Mc-Collum and K. H. Logan, U. S. Bur Stand Tech Pa 25:1-69 '13; Abstract, J. Fr. Inst. 180: 228-32 Ag '15

Galvanic corrosion damages hull of yacht. Eng N 74:522-3 S 9 '15

Insulation of underground piping. Elec R & W Elec'n 67:194 Jl 31 '15

Mitigation of destructive effects of electrolysis on reinforced concrete, underground pipes and cable sheaths. Eng & Contr 42:291-5 S 23 '14

Overhead electrolysis and porcelain strain insulators. S. L. Foster. il Am Inst E E Pro 3::1549-58 Ag '15; Abstract. Elec Ry J 46: 582-3 S 18 '15

Paints to prevent electrolysis in concrete structures. H: A. Gardner. il J Fr Inst 179: 313-36 Mr '15; Same. J Ind & Eng Chem 7: 504-10 Je '15; Same cond. Iron Tr R 57: 139-40+ Jl 15 '15; Abstracts. Eng N 73:138-7 Ja 21 '15; Eng Rec 71:465-6 Ap 10 '15; Am Soc M E J 37:297 My '15; Concrete Cem 6: 310 Je '15

Preventing corrosion from electrolytic action,

Preventing corrosion from electrolytic action, Power 41:740 Je 1 '15 Springfield (Mass.) electrolysis report. J. T. Harmer. Elec Ry J 45:507-8 Mr 13 '15 Tests show satisfactory return-circuit conditions in Providence, R. I. Elec Ry J 46:825-6 O 16 '15

See also Concrete, Effect of electricity on

Electromagnetic separation of ores. See Mag-netic separation of ores Electromagnetism

Developments in electromagnetism. E. Bloch, Sci Am S 79:338-9, 366-8 My 29-Je 5 '15 Electromagnetic radiation from the viewpoint of the electron theory. J. P. Minton. diags Gen Elec R 18:387-97 My '15 See also Electromagnets; Magnetization

Electromagnets

Calculation of electromagnet windings. E. E George and H. Pender. Elec W 65:529-31 1

27 '15

Electro-magnet for removing particles of iron from the flesh. il Mach 21:601 Mr '15; Elec R & W Elec'n 66:508 Mr 13 '15; Iron Age 95: 452 F 25 '15; Iron Tr R 56:525 Mr 11 '15; Sci Am S 79:168 Mr 13 '15

Electromagnets for alternating-current cruits. N. G. Meade. diags Power 41:14-16 Ja 5 '15; Correction. 41:203 F 9 '15

Experiments with a plunger electromagnet; determining the pull on the plunger when it is in motion. B. C. Batcheller. diag Elec W 65:1037-9 Ap 24 '15

Magnetization of iron at high flux density

Magnetization of iron at high flux density with alternating currents. J. S. Nicholson. Inst E E J 53:248-57; Discussion. 53:257-63 F 1 '15

Solenoid and electromagnet windings. G: L. Hedges. Am Inst E E Pro 34:2595-614 N '15 See also Armatures; Commutators; Induction coils

Charging

Recharging magneto magnets. R. J. Everest. il Automobile 32:414-15 Mr 4 '15

Electrometallurgy
Electric furnace and the melting of alloys.
R. S. Wile, Iron Age 95:1068-9 My 13 '15

Electric furnace in metallurgical work. D. A. Lyon, R. M. Keeney, and J. F. Cullen. bib-liog diags U S Bur Mines Bul 77:1-207 '14

Electricity in an ore-treating plant, il Elec R & W Elec'n 66:481-4 Mr 13 '15

Electrolysis of copper sulphate liquors, using carbon anodes. L. Addicks. ii dlag Met & Chem Eng 13:748-55 O 15'15

Electrolytic antimony refining. A. G. Betts. Met & Chem Eng 13:848-51 N 15 '15

Electrolytic copper refining; abstracts of papers by A. C. Clark and L. Addicks. Met & Chem Eng 13:661-2 O 1 '15

Electrolytic precipitation of gold, silver and copper from cyanide solutions. G. H. Cleven-ger, diags Met & Chem Eng 13:803-6, 852-60 N 1-15 '15

Electro-metallurgical industries as possible consumers of electric power. D. A. Lyon and R. M. Keeney. Am Inst Min E Bul 104: 1707-30 Ag '15; Excerpts. Iron Age 96:360-2 Ag 12 '15; Discussion. Am Inst Min E Bul 108:2502-7 D '15

Hydro-electrolytic treatment of copper ores. R. R. Goodrich, il Am Inst Min E Bul 104: 1551-94 Ag '15

on manufacture by electrolysis: methods commercially carried out in France. L. Guil-let. il Iron Age 94:1390-2 D 17 '14; Same. Sci Am S 79:70-1 Ja 30 '15 Iron

Electrometallurgy-Continued

Making use of segregation in electrolytic tank. Eng & Min J 100:356 Ag 28 '15 Modern methods for producing and refining various metals. J. W. Richards. Sci Am S 79:378-9, 398-9 Je 12-19 '15

See also Cyanide process; Electric furnaces; Electrochemistry; Electrolysis; Electrolytic corrosion; Electroplating; Electrostatic separation of ores; Electrotyping; Magnetic separation of ores; Metallurgy; Smelting, Electric

## Bibliography

Electric furnace in metallurgical work, D. A. Lyon, R. M. Keeney, and J. F. Cullen, U.S. Bur Mines Bul 77:190-207 14

Electrometer

Highly sensitive electrometer; abstract. A. L. Parson. Elec W 66:1211 N 27 '15 Vibration electrometer. H. L. Curtis. diags U S Bur Stand Bul 11:535-52 My 27 '15; Excerpts. Sci Am S 79:330 My 22 '15; Abstract. Elec R & W Elec'n 66:606-7 Mr 27 '15

Electromotive force

Hydrogen- and hydroxyl-ion activities of solutions of hydrochloric acid, sodium and potassium hydroxides in the presence of neutral salts. H. S. Harned, diag Am Chem Soc J 37:2460-82 N '15

37:2400-82 N 10 Liquid junction potentials, D. A. MacInnes, Am Chem Soc J 37:2301-7 O '15 Potential of silver in nonaqueous solutions of silver nitrate. V. L. Gibbons and F. H. Get-man, bibliog diags Am Chem Soc J 36:1630-

man. bibliog diags Am Chem Soc J 50:1000-55 Ag '14
Reducing power of photographic developers as measured by their single potentials. F. C.
Frary and A. H. Nietz. diags Am Chem Soc J 37:2246-63 O '15
Shape of the pressure wave in electrical machinery. S. P. Smith and R. S. H. Boulding. diags Inst E E J 53:205-38; Discussion. 53: 238-47, 323-5 F 1-15 '15
Studies of a new kind of e. m. f. R. Beutner. diags Am Chem Soc J 36:2040-59 O '14

See also Concentration cells; Passivity

See also Concentration cells: Passivity

Electrons

lectrons
Application of the electron theory to various phenomena. J. P. Minton. bibliog Gen Elec R 18:287-95 Ap '15
Atoms, molecules and electrons. N. W. Rakestraw. Sci Am S 80:254-6 O 16 '15
Criticism of the electron conception of valence. R. F. Brunel. Am Chem Soc J 37:709-22. Ap '15
Degrees of valently of swiftly moving electric

Decrease of velocity of swiftly moving electrified particles in passing through matter; abstract. N. Bohr. Elec W 66:1042 N 6 '15 Developments in electromagnetism. E. Bloch. Sci Am S 79:338 My 29 '15 Electromagnetic radiation from the viewpoint of the electron theory. J. P. Minton. diags Gen Elec R 18:387-97 My '15 Electron conception of valence: inorganic compounds. J. M. Nelson and K. G: Falk. Am Chem Soc J 37:274-86 F '15 Electron conception of valence: the theory of electrolytic dissociation and chemical action. K. G: Falk and J. M. Nelson. Am Chem Soc J 37:1732-48 JI '15 Electron theory and metallic selenium crystals. Elec W 64:1152 D 12 '14 Electron theory of electric conduction in metals. J. P. Minton. Gen Elec R 18:204-9 Mr '15

Electronic conception of positive and negative valences, H. S. Fry. Am Chem Soc J 37:2368-73 O '15

73 O '15
Electronic theories of the properties of metals.
C. H. Lees. Sci Am S 80:320 N 13 '15
Interpretations of some stereochemical problems in terms of the electronic conception of positive and negative valences. H. S. Frv. Am Chem Soc J 37:855-92 Ap '15
Magneton theory of atomic structure: abstract, D: L. Webster. Elec W 66:599-600 S 11 '15
Pure electron discharge and its applications in radio telegraphy and telephony. I. Langmuir. diags Gen Elec R 18:327-39 My '15
Theory of valency and molecular structure. W: C. Arsem. Am Chem Soc J 36:1655-75 Ag '14

See also Cathode rays; Ions; Radioactivity

Electrophysics

lectrophysics
Application of the electron theory to various phenomena. J. P. Minton. bibliog Gen Elec R 18:287-95 Ap '15
Cathode rays and their properties. J. P. Minton. diags Gen Elec R 18:118-25 F '15
Characteristics of cathode ray tubes. J. P. Minton. diags Gen Elec R 18:636-40 JI '15
Electromagnetic radiation from the viewpoint of the electron theory. J. P. Minton. diags Gen Elec R 18:387-97 My '15
Electron theory of electric conduction in metals. J. P. Minton. Gen Elec R 18:204-9 Mr '15

See also Electric currents, Alternating; Electric precipitation; Electric units; Elec-tric waves; Electrochemistry; Radioactivity; Radiography

Electroplaters' society, American. See American electroplaters' society

Electroplating

lectroplating
Action of certain colloids on ions during electrolysis. A. Mutscheller. diags Met & Chem Eng 13:353-7 be '15
Bronzing processes suitable for brass and copper. T. I. Baker. Metal Ind n s 13:464-5 N '15 (to be cont)
Cleaning and plating in the same solution. O. P. Watts. Metal Ind n s 13:244-7 Je '15
Copper cyanide plating solutions. M. C. Weber. Metal Ind n s 13:95-6 Mr '15; Same. Met & Chem Eng 13:255-6 Ap '15; Same. Foundry 43:197-8 My '15; Same. Sci Am S 79:302 My 8 '15
Demonstration of metal cyanidae at 250.

Demonstration of metal cyanides at Lewis institute, Chicago, Ill. il Metal Ind n s 13: 124 Mr '15

Determining weight of deposit. L. C. Wilson. il Metal Ind n s 12:206-7, 335-7, 505-6; 13: 152-4, 277-8 My, Ag, D '14, Ap, Jl '15 (to be conf)

cont)
Digest of electrochemical U. S. patents prior
to 1903. Publishing in Metallurgical and
chemical engineer beginning with April, 1914.
Economy and efficiency of copper cyanide.
C: H. Proctor. Foundry 43:199-200 My '15
Efficiency, standardization's double. Metal Ind
n s 13:379-80 S '15
Electrolytic lead deposits. F. C. Mathers and
A. McKinney. Met & Chem Eng 13:328 My
'15
Electro-platers' convention. Line 3-5. Dayton

Electro-platers' convention, June 3-5, Dayton, O. C: H. Proctor. Metal Ind n s 13:223-5 Je '15

Electro-plating with cobalt. C: H. Buchanan and T: Haddow. Metal Ind n s 13:240-2 Je

Tiste Country and W. L. Savell. J Ind & Eng Chem 7:379-99 My '15; Excerpts (Conclusions). Met & Chem Eng 13:328-9 My '15; Elec R & W Elec'n 66:373 My 8 '15; Summary. Eng M 49:422-3 Je '15

French process for electroplating mirrors with copper. il Elec R & W Elec'n 66:922-3 My 15 '15

'15
Making the silver solutions. O. A. Hillman.
Metal Ind n s 13:416-17 O'15
Modern acid-dipping, electroplating and japanning plant. H. N. Trumbull. il Gen Elec R
18:1121-6 D'15
Modern plating equipment and supplies. E. S.
Thompson. Metal Ind n s 12:153-4, 515 Ap,
D'14

New form of electroplating barrel, il Iron Age 96:979 O 28 '15
Polishing and plating room practices reviewed, F. W. Hobbs, Metal Ind n s 13:414-15 O '15

Preparation and operation of all lead plating baths. F. C. Mathers, Metal Ind n s 13:184-5 My '15

Proper use of ammeter and voltmeter in plating room. Metal Ind n s 13:67-8 F '1

Relative migration velocities of the ions in complex electrolytes. A. Mutscheller, Met & Chem Eng 13:439-42 Jl '15

Removing grease by electricity; the modern way to prepare metal articles for plating operations. T: Brown. Metal Ind n s 13: 192-4 My '15

Testing of electro-plating solutions, diag Metal Ind n s 13:20-1 Ja '15

Electroplating —Continued

Twentieth century electro-plating plant; Spirella company's Niagara Falls, N. Y., installation. G. W. Grupp. il Metal Ind n s 13: lation. G. W 331-2 Ag '15 nit energy

Unit energy consumption in electroplating establishment, il Elec W 66:804 O 9 '15 Voltmeter and ammeter in the plating room. S. E. Huenerfauth. Metal Ind n s 13:71 F '15 See also Electrometallurgy; Galvanizing; Nickel plating; Silver plating

Electroscope

Practical methods for the determination of radium S. C. Lind, it diag J Ind & Eng Chem 7:406-10 My '15

Electrostatic potential and synchronism indi-cators. il Elec Ry J 46:326 Ag 21 '15; Elec R & W Elec'n 67:251-2 Ag 7 '15; Elec W 66: 310-11 Ag 7 '15; Power 42:271-2 Ag 24 '15

Electrostatic separation of ores

& Min J 98:264-7 Ag 8 '14; Same. Sci Am S 80:173-4 S 11 '15; Same cond. Eng M 48: 80:173-4 S 105-8 O '14

Electrotherapeutics

See also Radiotherapy

Electro-thermostatic control

Electro-thermostatic control of radiators. Sci Am 112:364+ Ap 17 '15

Electrotyping
Preliminary circular of information regarding
testing of electrotyping solutions issued by
the Bureau of standards. Inland Ptr 54:391-2

Regulation of electrotyping solutions. diag U S Bur Stand Circ 52:1-12 '15; Abstract Met & Chem Eng 13:258-60 Ap '15

See also Stereotyping

Elements, Chemical. See Chemical elements

Elephant Butte dam

Closure made at Elephant Butte dam, New Mexico. Eng Rec 71:274 F 27 '15 Concreting methods and records, Elephant Butte dam. E. H. Baldwin, diags Eng N 74:

696-8 O 7 '15 Excavation for foundation of Elephant Butte dam, E. H. Baldwin, il diags plan Eng N 73:49-54 Ja 14 '15 Placing masonry for the Elephant Butte dam, New Mexico, E. H. Baldwin, il diags Eng N 74:645-9 S 30 '15

Elevated railroads

ck car for elevated-railway reconstruc-n. J. M. Ryan. il diag Eng N 73:986-7 My

20 15
Design of steel elevated railways, N. Y. rapid transit system. M. E. Griest. il diags Eng N 73:971-7 My 20 '15
Full-load secondary stresses in elevated railway bents. L. R. Manville. Eng N 74:949-51 N 11 '15

How some problems in the New York elevated improvement work were solved, il diags Eng Rec 71:781-3 Je 19 '15 Laying new track under an old elevated railway platform, diags Eng N 73:1180-1 Je 17 '15

'15
Mile and a half of track on New York elevated line rebuilt in fourteen days. il Eng Rec 72:363-4 S 18 '15
Ornamental concrete elevated railway, New York city. M. E. Griest. il diags Eng N 74: 913-18 N 11 '15
Railroad building under and over the streets of New York, il map Sci Am 113:142-3+ Ag 14 '15

Rapid steel erection on third track work, Second avenue elevated, New York. il diags Eng Rec 71:86-7 Ja 16 '15

Rebuilding elevated railways in New York city, il diags plan map Eng N 74:625-30, 683-7 S 30-O 7 '15

Safety of trains on the Chicago elevated. Elec Ry J 46:302-5 Ag 21 '15

Section of New York elevated rebuilt under heavy traffic without an accident, il map Eng Rec 72:470-2 O 16 '15

Temporary support for an elevated-railway bent. H. L. Dlyn. il Eng N 74:122-3 Jl 15 '15

Track-raising in building a hump station, New York elevated lines. il diags Eng N 74: 269-71 Ag 5 '15 Typical and special construction used on Queens extension to New York elevated. il diags Eng Rec 72:76-8 Jl 17 '15 Word about elevated railroads in general. Elec Ry J 45:71-2 Ja 2 '15

### Stations

Architectural treatment of special elevated stations of the dual system, New York city S. J. Vickers. il Am Inst Arch J 3:501-2 1 '15

Stations for third track, New York elevated, placed above existing platforms. il diags Eng Rec 72:138-9 Jl 31 '15

Types of elevator lobbies in office buildings. C. F. Baker. il plans Arch Rec 38:631-40 D Elevator lobbies

Elevators

Elevator-rail greaser, diag Power 41:82-3 Ja

Hydraulic elevators shut down by broken gate valve, diag Eng N 74:574 S 16 '15 Notes on elevator pumps, T: J. Rogers, diags Power 41:741-2 Je 1 '15 Seventy years of inventions, il Sci Am 112: 515 Je 5 '15

See also Hoisting machinery

#### Safety devices

Maximum rate of safe retardation for passenger cars and elevators. Eng N 72:1132-3 D 3 '14

Sixth award of the Scientific American medal for safety devices, W: H. Tolman, il Sci Am 112:174 F 20 '15

When the elevator runs away, il Sci Am 113: 274 S 25 '15

Elevators, Electric

Automatic electric elevator dispatcher, N. G.

Meade, diags Power 41:540-1 Ap 20 '15

Characteristics of direct-current motors for
elevator service. A. Brunt. il Am Inst E E
Pro 34:2767-82 N '15

Electric elevator. H. D. James, Am Inst E E
Pro 34:3006-11 D '15

Electric elevator are corretion and maintenance.

Pro 34:3006-11 D '75
Electric elevators, operation and maintenance.
A. C. Bender, il diags Elec R & W Elec'n 66:947-52, 985-9, 1060-2 My 22-Je 5 '15
Line disturbance caused by special squirrel-cage and wound-rotor motors when starting elevators and hoists. J. C. Lincoln. diag Am Inst E E Pro 34:421-31 Mr '15; Discussion. 34:2847-50 N '15

Modern electric elevator and elevator prob-lems. D: Lindquist. il diags Am Soc M E J 37:309-24 Je '15; Abstracts. Power 41:656-7 My 11 '15; Elec W 65:1011-12 Ap 17 '15; Discussion, Am Soc M E J 37:324-33 Je '15

Rational basis of comparison of the duties of electrical elevators and hoisting engines. A. M. Coyle. Am Soc M E J 37:395-400 Jl

Elevators, Grain. See Grain elevators

Elevators, Inclined
Inclined elevators increase economy of marine
terminals. il Int Marine Eng 20:119 Mr '15

#### Elgin, Illinois Water supply

Experience with artesian well water. R. R. Parkin. Am Water Works Assn J 2:407-9 Je '15

Eliot, Charles William, 1834-Appreciation, M. Benjamin. por Sci Am S 78: 411 D 26 '14

Ellen Wilson memorial homes, Washington, D. C.

Town planning and housing. G: B. I plans Am Inst Arch J 3:352-7 Ag '15 Ellipses

Method of drawing an ellipse. A. W. Schoof, diags Mach 21:496-7 F '15

Simple method of drawing ellipses. diags Eng & Min J 99:1080 Je 19 '15

Elm trees

Hickories, elms and ash trees. W. H. Miller. il Am For 21:719-29 Je '15

Elutriators

Air analyzer for determining the fineness of cement, J. C. Pearson and W. H. Sligh, il diags U S Bur Stand Tech Pa 48:1-74 '15; Summary, J Fr Inst 179:712-14 Je '15; Sum-mary, Eng Rec 71:737 Je 12 '15

Embankments
Building the earth embankment for Hill View reservoir. A. W. Tidd. il plan Eng N 74: 500-5 S 9 '15
Cutoff-wall and rock grouting at the Milton reservoir embankment. il diags map Eng N 73:468-71 Mr 11 '15
Earth embankment and fill at Shopton, Iowa. il plan Eng N 72:1172-3 D 10 '14
Earth fill replaces trestle for irrigation canal. il diags Eng Rec 71:525-6 Ap 24 '15
London county hall. diags Engineer 120:147-8 Ag 13 '15
Railroad subgrade troubles—preventives and cures. J. T. Bowser. Eng Rec 72:203-4 Ag 14 '15

Simple construction reclaims 7000 acres of rich land at low cost, Pitt Meadow, B. C. H. M. Burwell. il diag map Eng Rec 72:330-1 S 11

See also Sea walls

Embargo

British wool embargo. Textile World 48:559-62 Mr '15

Details of rubber embargo lifting. Horseless Age 35:222-3 F 17 '15

Embezzlement

Defalcations. L. U. Crawford. J Account 20: 112-21 Ag '15

Embossing (typography)
Electrically heated embossing block. il Elec
W 66:995 O 30 '15

Emboso sales company protests. W. B. West-lake. Inland Ptr 54:357-8 D '14 Outgrowths of letterpress. G: Sherman. diag Inland Ptr 54:197-200, 343-6 N-D '14

Embroidery patterns
Outgrowths of letterpress: transfer and perforated embossing patterns. G: Sherman. il Inland Ptr 54:343-6 D '14

Emery

Emery around a dynamo. B: J. Oppenheim. Power 41:275-6 F 23 '15 Emery around a dynamo. W. Weaver. Power 40:855 D 15 '14

See also Grinding and polishing

Emery wheels
Constructing emery wheel exhaust heads.
diags Metal Work 82:787-9 D 18 '14
Emery tool grinder for patternmakers. C.
Murphy. diag Foundry 43:300 Ag '15
New safety hood for emery wheels. il Iron Age
95:244 Ja 28 '15
Origin of the emery wheel, il Engineer 119:
608-9 Je 18 '15

See also Grinding wheels

Emissivity. See Radiation

Emmet, William Le Roy, 1859-Sketch. por Eng M 50:216-17 N '15

Empire state gas & electric association New York state convention, Schenectady, May 6-8. Elec W 65:1267-9 My 15 '15

mployees
Advertising influence of employees. F. R.
Slater. Elec R & W Elec'n 66:1147-8 Je 19
'15; Same. Am Gas Light J 103:149-50. S 6
'15; Abstract. Elec Ry J 45:1029 My 29 '15
Best methods of dealing with men. H. E.
Gamble. Ry Age (Mech ed) 89:61 F '15
Business efficiency and the human element.
M. Chapman. Metal Work 84:71-2 J1 16 '15
Business relations of salesman and employer.
F. Farrington. Metal Work 84:578-9 N 5 '15
Can employer state his opinion of employee.
E. J. Buckley. Metal Work 84:687 N 26 '15
Card record of employees. C. E. Fairbanks.
Eng M 48:573-5 Ja '15
Card record of employees. S. G. Koon. Eng

Card record of employees. S. G. Koon. Eng M 49:88-90 Ap '15

Contractor's method for holding good men. M. C. Tuttle, Eng N 73:694-5 Ap 8 '15 Examining the physique of Chicago elevated employees, H. E. Fisher, il Elec Ry J 46:216-19 Ag 7 '15

How to keep men in your employ. W. A. Grieves. Iron Tr R 57:488-9+ S 9 '15
How to keep your men healthy. S. C. Coey. Iron Tr R 56:389-90 F 18 '15
Human element. J. Hartness. Iron Age 94:1297
D 3 '14; Same. Metal Work 82:780 D 11 '14; Same. Am Gas Light J 102:17-18 Ja 11 '15; Same. Am Soc M E J 37:2-3 Ja '15
Human factor in production. A. A. Dowd. Iron Tr R 55:1186+ D 24 '14
Human nature and successful shop management. R. T. Gebler. Metal Work 82:823-4 D 25 '14

25 '14 T. Gebiel. Metal Wolk 2.823-4 D
25 '14 Making of men, motor cars and profits. O. J.
Abell. il Iron Age 95:33-41+ Ja 7 '15
Periodic physical examination of employes.
E. L. Fisk. Am Ind 15:21-3 F; 22-3 Je '15
Physical control of employees. Eng & Min J
100:759 N 6 '15
Physician in industry; how the science of preventive medicine is minimizing accidents.
S. M. McCurdy. Iron Age 95:401 F 18 '15;
Same. Sci Am S 79:265 Ap 24 '15
Selling stock to employees. C: F. McElroy.
Inland Ptr 56:182-4 N '15
Three position plan of promotion. F. B. Gilbreth and L. M. Gilbreth, Iron Age 96:10579 N 4 '15

9 N 4 '15
Training and holding competent employes.
F. Mappes. Metal Work 82:731-3 D 4 '14
Where the money goes. R. O. Wye. Elec R &
W Elec'n 65:1210-11 D 26 '14
Word to managers about their men. W:
Gould. Elec W 66:336-8 S 4 '15

See also Apprentices; Employment systems; Foremen; Industrial betterment; Welfare work in industry

Employees, Government. See Government emplovees

Employees, Training of
Improvement of distribution employees. C. E.
Reinicker. il Am Gas Inst Pro 9:pt 2, 12421302 '14; Same cond. Am Gas Light J 102:
33-9 Ja 18 '15; Discussion. Am Gas Inst Pro
9:pt 2, 1302-10 '14

See also Apprentices; Corporation schools; Schools and shops, Cooperation of

Employers' associations

mployers' associations Commercial organizations in the United Kingdom with a description of British manufacturers' and employers' organiza-tions. A. J. Wolfe. U.S. Bur For & Dom Com 102:41-53 '15

Employers' organizations versus those of employees. H. Bryant. Inland Ptr 54:493-5 Ja

Employers' liability
Employees' injuries and what they cost. A. L.
H. Street. Iron Age 95:481-2 F 25 '15

See also Workmen's compensation

Employment agencies

See also Labor exchanges

Employment systems

mployment systems
Choosing and training the college engineer.
Iron Age 95:1112-13 My 20 '15
Cost of failures on your pay roll. E. St. E.
Lewis. Iron Tr R 56:132 Ja 21 '15
Employment bureau. H. G. Winsor. Elec Ry J
46:9-10 Jl 3 '15
Fundamentals involved in the help problem.
C. F. Raymond. Am Ind 15:28-9 Ja '15

Greater care in employing workmen will pay the contractor. H. D. Hammond. Eng Rec 71:501-2 Ap 17 '15

Hiring and firing: the economic waste and how to avoid it. M. W. Alexander. Am Ind 16:17-22 Ag '15; Excerpt. Ry R 57:286-7 Ag 28 '15 28

How do you select and promote your men. R. V. Wright. Ry Age 59:231-3 Ag 6 '15; Same. Ry Age (Mech ed) 89:387-9 Ag '15

Human raw material and finished product. J. M. Mackay. Metal Work 83:183 Ja 29 '15

Irregular employment; cost and causes. H: Dennison. Am Soc M E J 37:280-1 My '15

Neglected principle of the safety first movement: proper selection of trainmen. C. J. Franklin. Elec Ry J 44:1244-6 D 5 '14

Plan for improving the position of railway clerks. Ry Age 59:887 N 12 '15

Employment systems—Continued Selecting the right occupation. Eng N 74:321-2 Ag 12 '15

Supervisor of personnel and his functions. E. M. Hopkins. Ind Eng 15:7-11 Ja '15; Summary. Iron Age 94:1371-2 D 10 '14 Waste in hiring and discharging employees. M. W. Alexander. Sci Am S 79:102-3 F 13 '15; Same cond. Am Gas Light J 103:43-4 J 19 '15; Abstract. Iron Age 94:1032-3 O 29 '14; Abstract. Metal Work 82:609-10 N 6 '14; Abstract. Eng M 48:733-6 F '15

See also Employees

Emporia, Kansas

Municipal-utility problem at Emporia, Kan.; a central station leased to a progressive syndicate. il Elec W 65:1106-7 My 1 '15

Empress of Ireland (steamship)
Salvage work on the Empress of Ireland. R. G.
Skerrett. il plan diag Int Marine Eng 20:60-2
F '15; Same cond. Sci Am 112:49 Ja 9 '15

Emscher tanks

mscher tanks
Measuring the drainability of Emscher tank
sludge. W. L. Stevenson. il Eng & Contr 44:
212 S 15 '15; Same. Munic J 39:427-8 S 16
'15; Same cond. Eng N 74:566 S 16 '15
Preliminary report on Emscher tanks and
kindred sewage-clarification processes. K.
Thumm and E. C. Reichle. Eng N 72:1306-8
D 31 '14

Enamel and enameling
Electrically heated enameling ovens. C. W.
Bartlett. il Gen Elec R 18:1130-5 D '15
6000-kw electric enameling load. il plan Elec
W 65:1702-3 Je 26 '15
Using electric ovens for enameling. il Iron Tr
R 57:215 Jl 29 '15

See Osmosis Endosmose.

Endowments

Awards for new truth. Sci Am 113:392 N 6

Energy. See Force and energy; Free energy Engine houses. See Roundhouses

Engineering

Application of engineering methods to the problems of the executive, director and trustee. H. Godfrey. Am Soc M E J 37:334-40

Je '15
Engineer a practical idealist. C: D. Marx. Eng
Rec 72:378-80 S 25 '15
Human factors in engineering practice. J: Calder. Stevens Ind 32:193-206 JI '15
Recent significant developments in science and engineering. Sibley J 29:109-14 Ja '15;
Same. Sci Am S 79:83 F 6 '15
Relation of physical science to the development of engineering. R. C. Gibbs. Sibley J 29:129-32 Ja '15
Requisites for success in engineering. F. H.
Fay. Boston Soc C E J 1:249-62 Ap '14
Review of the year 1914. Sci Am 112:6-7 Ja 2 '15

Roman technics and industry in early Germany. Sci Am S 79:130 F 27 '15 Year's review. Power 41:21-6 Ja 5 '15

See also Aeronautics; Aqueducts; Arches; Architecture; Blasting; Breakwaters; Bridges; Building; Building materials; Canals; Chemical engineering; Civil engineering; Curve plotting; Curves; Docks; Domestic engineering; Drainage; Dredging; Earthwork; Electric engineering; Embankments; Engineers; Engines; Foundations; Gas engineering; Grouting; Harbors; Haulage; Hydraulic engineering; Irrigation; Machinery; Marine engineering; Irrigation; Machinery; Marine engineering; Masonry; Mechanical drawing; Mechanical handling; Military engineering; Mining engineering; Municipal engineering; Railroad engineering; Railroads—Construction; Reclamation of land; Rivers; Roads; Sanitary engineering; Sea walls; Shop management; Shore protection; Standards, Engineering; Steam engines; Subways; Surveying; Tunnels and tunneling; Walls; Water supply engineering lucts; Arches; Breakwaters; See also Aeronautics: Aqueducts;

# Accounting

Cost accounting on construction work, with a description of the system used by the Aberthaw construction company. L. H. Allen. forms Boston Soc C E J 1:133-77 Mr '14; Discussion. 1:455-79 O '14

Development of a unit cost system. N. Cunliff, il Assn Eng Soc J 53:74-85 Ag '14; Same, Eng & Contr 42:374-6 O 21 '14; Discussion. Assn Eng Soc J 53:85-101, 165-70 Ag-S '14

#### Estimates

rie canal enlargement greatly exceeds the estimated cost. Eng & Contr 43:139-40 F 17

Estimating. C. R. Kreider. Elec R & W Elec'n 66:196-8 Ja 30 '15 Value of published costs. W. K. Palmer. Elec Ry J 45:845-6 My 1 '15

## Examinations

California examination for construction engineer. Eng N 74:1081 D 2 '15
Engineers and civil-service examinations in Philadelphia and elsewhere. A. M. Swanson. Eng N 73:277-9 F 11 '15
Examinations for commissions, corps of engineers. Eng N 74:513-14 S 9 '15

#### Study and teaching

Methods of instruction in engineering extension; with discussion, K. G. Smith. W Soc E J 20:266-86 Mr '15

See also Engineering education

# Tables, calculations, etc.

Computing area of segments of circles. H. N. Bradstreet. Eng N. 73:692 Ap. 8'15
Computing offsets to circular curves. L. Pistner. Eng Rec 71:171, 307 F 6, Mr 6'15
Reactions in a three-legged stiff frame with hinged column bases; with discussion. N. M. Stineman. W Soc E J 19:881-920 N'14

To compute offsets to vertical curves. Cunningham. Eng Rec 71:244 F 20 '15

#### Cuba

American engineer in Cuba. F. E. Small. Power 41:83 Ja 19 '15

Italy and engineering. Sci Am S 80:11 Jl 3 '15

# South America

South America as a field for American engineers. B. Willis. Eng Rec 70:620 D 5 '14

Engineering prospects in Turkey. Engineer 119:371-2, 395-6 Ap 16-23 '15

#### United States

American engineering in 1914. Engineer 119: 128, 164-5, 174-5 F 5-19 '15

Engineering features of the Panama-Pacific international exposition. G. L. Bayley. il Am Soc M E J 37:571-91, 696-8 O, D '15; Abstract. Eng N 74:845-6 O 28 '15; Discussion. Am Soc M E J 37:698-9 D '15

Engineering works of the West, il Eng Rec 72:261-4 Ag 28'15

Engineering, Chemical. See Chemical engineering

Engineering, Civil. See Civil engineering

Engineering, Electric. See Electric engineering Engineering, Hydraulic. See Hydraulic engineering

Engineering, Marine. See Marine engineering Engineering, Mining. See Mining engineering Engineering, Municipal. See Municipal engineering

Engineering, Sanitary. See Sanitary engineer-

Engineering, Steam. See Steam engineering

Engineering buildings
City of Jacksonville engineering building.
W. P. Darwin, il plans Eng N 72:1220 D 17

Engineering bureaus

Iowa engineering society discuss the technical service bureau. Eng N 73:411 F 25 15

Iowa engineers object to technical service bureau. Eng Rec 71:279 F 27 '15

Minnesota surveyors and engineers discuss bureau of engineering cooperation. Eng N 73:412 F 25 '15

Engineering bureaus-Continued

State competition with private engineers. Eng N 73:450 Mr 4 '15 State technical bureaus and the consulting engineer. Eng Rec 71:255 F 27 '15

Engineering colleges

Competition by professors in engineering schools. Eng N 73:276-7, 452-5, 646 F 11, Mr 4, Ap 1 '15

See also Throop college of technology

### Advertising

One way to advertise an engineering school, Eng N 74:32-3 Jl 1 '15

Engineering congress, International. See International engineering congress

Engineering education American engineering education makes rapid advances. G: F. Swain, Eng Rec 72:387-9 S 25 '15

Automobile engineering curricula at the University of Michigan. W. T. Fishleigh. Horseless Age 35:111-14 Ja 20 '15
Broad survey of engineering education. Eng N 73:993-4 My 20 '15
Co-operative technical schools meet present needs. F. E. Ayer. Eng N 74:1059-61 D'2 '15
Course which gives broad training in business and economics. Eng Rec 72:323-4 S 11 '15
Education for professional success. S. H. Bunnell. Eng Rec 71:688-9 My 29 '15
Eminent members of profession discuss present standing of engineers. Eng Rec 71:361-4 Mr 20 '15
Engineering education, engineering success and leadership among men. Eng & Contr 43:

ngineering education, engineering success and leadership among men. Eng & Contr 43:

350 Ap 21 '15 Illuminating engineering as a branch of technical instruction. C. E. Clewell. diags Illum Eng Soc 10:321-37; Discussion. 10:338-52 no

New advanced course in electrical engineering at Columbia university. W. I. Slichter. il Gen Elec R 18:940-4 O '15 Relation of educational training to the practice of engineering. W: H. Burr. Eng Soc W Pa 31:56-73; Discussion. 31:73-113 F '15 Shop training that is worth while. R. E. Kennedy and J. H. Hogue. il Iron Tr R 57:617-23 S 30 '15; Same. Foundry 43:495-11 O '15 Should another course be added to the engineering schools' curriculum. R. C. Hardman, Eng N 74:563-4 S 16 '15 Suggestion for technical schools. H: R. Gilson. Mach 21:770-1 My '15 Training of the civil engineer. Eng Rec 70:655 D 19 '14 Washburn shops of the Worcester Polytechnic

Washburn shops of the Worcester Polytechnic institute. G: I. Alden. Am Soc M E J 37:391-4 J1 15

What is the trouble with our engineering education? E: Orton, jr. Eng N 74:822-3 O 28 '15 See also Engineering colleges; Industrial service movement; Railroad education; Technical education

Engineering ethics

competition by professors in engineering schools. Eng N 73:276-7, 452-5 F 11, Mr 4

Ethical advertising for engineers. W: O. Sell. Eng Rec 71:660 My 22 '15

See also Professional ethics

Engineering foundation
Board named to control Engineering foundation. Eng Rec 71:695-6 My 29 '15
Endowment fund established by the United engineering society. Eng N 73:93 Ja 14 '15 Engineering foundation. Am Soc M E J 37:iii-x

Engineering foundation. Power 41:179-80 F 2

Engineering foundation established. Am Ind 15:42+ Mr '15

Engineering foundation established, Iron Age 95:289-90 F 4  $^{\prime}15$ 

Engineering foundation; first regular meeting. Elec R & W Elec'n 66:1047 Je 5 '15

Engineering foundation started with \$200,000 gift. Eng Rec 71:153-4 Ja 30 '15

Foundation rests on broad ideas. Iron Tr R 56: 289-90 F 4 '15

Gift of \$200,000 for the advancement of the profession of engineering. Eng N 73:226-8 F

Engineering laboratories

ngineering laboratories
Engineering experiment station of the University of Illinois, E. B. Paine. Am Inst E. E. Pro 34:2421-7 O '15
Laboratory control of water supplies. E: Bartow. il diags plan Am Water Works Assn J. 1:720-6 D '14
Standard practice instructions for concrete testing laboratory. R. E. Goodwin, il Eng N. 73:202-8 F 4 '15

See also Electric laboratorica. Minima laboratory.

See also Electric laboratories; Mining laboratories

Engineering law
Discussion of some legal principles of interest
to engineers. W: L. Bowman. Eng & Contr
42:552-4 D 16 '14

See also Boilers-Laws: Building See also Bollers—Laws, Building laws, Electric engineering—Laws; Engineers— Licenses; Heating—Laws; Plumbing laws; Railroad law; Sewerage—Laws; Ventilation— —Laws; Waterworks—Laws

Engineering libraries
Growth of engineering libraries and need of indexes. Ry R 56:189-91 F 6'15
Growth of engineering libraries and the need of indexes. H. W. Wilson, Ry R 56:130 Mr 27 '15 Indexing engineering literature. L. B. Krause.

Indexing engineering literature. L. B. Krause. Ry R 56:356 Mr 13 '15 Reclamation service has unique library. Eng N 74:787 O 21 '15 Work of engineering libraries. Eng Rec 71: 351 Mr 20 '15 Work of engineering libraries. K. C. Walker. Eng Rec 71:438 Ap 3 '15

Engineering literature
Early engineering handbooks, Mach 21:664 Ap
15

15
Indexing and filing technical literature, A. R. Kenner, Eng & Min J 99:851-6 My 15 '15
Proposed system of classifying and digesting the records of the society; with discussion, E. J. Prindle, Am Soc M E J 37:272-6 My '15
Suggested activity for the engineering foundation; indexing. Power 41:339-40 Mr 9 '15

See also Engineering libraries; Engineering periodicals

Engineering materials

See also Building materials; Concrete Iron; Steel; Strength of materials; Testing

Engineering offices Uptodate city-engineering office, M Iowa; plan. Eng N 74:1040 N 25'15 Muscatine.

Engineering periodicals
Filing periodical literature. Ry R 57:657-8 N
20 15

How can engineers best utilize the technical journals? J: W. Alvord. Eng & Contr 42: 306-8 S 30 114 now can engineers best unize the technical journals? J: W. Alvord. Eng & Contr 42: 306-8 S 30 '14
Reading of a technical journal. H. S. Cooper, Elec Ry J 45:716-17 Ap 10 '15

Engineering records

Bridge cost record used by the Illinois highway commission. Eng & Contr 42:200-3 Ag

City engineer's records in Frankfort, Ind. R. H. Boynton, Munic Eng 49:78-9 Ag '15; Same. Eng & Contr 44:165-6 S 1 '15

Same. Eng & Contr 44:165-6 S 1 '15

Engineering reports
How can annual reports of city engineering departments be improved? Eng Rec 71:254, 406-7 F 27, Mr 27 '15

More about annual and other reports. Eng Rec 71:512-13 Ap 24 '15

Regulations governing preparation of reports on water supply systems and extensions in Saskatchewan. Eng & Contr 42:131-2 Ag 5 '14

Scope of engineering reports and plans for sewerage and sewage disposal works in Saskatchewan. Eng & Contr 42:155-6 Ag 12

Engineering reports—Continued

Western society of engineers upholds status of engineering report. Elec R & W Elec'n 66:396 F 27 '15

of engineering report. Elec R & W Elec n 66:396 F 27 '15

Engineering societies

Annual dues. Elec W 65:1227 My 15 '15

Association of national engineering societies.

Eng N 73:83 Ja 14 '15

Contests in engineering society elections. Eng N 72:1319-20 D 31 '14

Co-operation or amalgamation of local engineering societies. Eng N 74:1042-3 N 25 '15

Directory of electrical associations. Elec W 66:1063 N 6 '15

Duties and sphere of action of a local engineering society with special reference to the Boston society of civil engineers. H. P. Eddy. Boston Soc C E J 2:149-63 Ap '15

Engineer awakes; abstracts. F. H. Newell. Eng & Contr 44:221-3 S 22 '15; Eng N 74: 568-70 S 16 '15; Power 42:459-60 S 28 '15; Eng Rec 72:420-1 O 2 '15

Financing engineering societies. Elec R & W Elec'n 66:799 My 1 '15

Future of the engineering profession. A. J. Himes. Eng Rec 72:663 N 27 '15

How one engineering society secured publicity. C. E. Drayer. Eng Rec 70:645-6 D 12 '14

Ideal engineering society. P. M. Lincoln. Am

Ideal engineering society. P. M. Lincoln. Am Inst E E Pro 34:623-4 Ap '15
Illuminating engineering society. C. H. Sharp; W. D. Weaver. Elec R & W Elec'n 66:918-20 My 15 '15

Importance of the local engineering society. Eng N 72:1320-1 D 31 '14 List of engineering societies of the United States and Canada. Eng N 73:1099-1104 Je

Local engineering society; discussion. J. F. Druar, Assn Eng Soc J 53:301-4 D '14 Rules for society programs. Eng Rec 72:536 O 30 '15

time at hand when the engineering society should awake to its deficiencies; abstracts. E. McCullough. Eng Rec 72:421-2 O 2 '15; Power 42:530-1 O 12 '15

E. McCulholsh. Eng. 10 12 '15 Power 42:530-1 O 12 '15 What the Southwestern electrical and gas association can do for me. A. V. Wainwright. Am Gas Light J 103:172-3 S 13 '15 See also names of societies, e. g. As ated engineering societies of St. Louis Associ-

Engineering standards. See Standards, Engineering

Engineers

Commission plan for control of public works. Eng N 73:1186-8 Je 17 '15 Constitution and list of members of the American water works association. Am Water Works Assn J Sup 1:1-94 D '14 Coöperation proposed between engineers and the Chicago association of commerce. Ry R 56:442 Mr 27 '15 Deficiency in personality responsible for engineer's failure to receive recognition. G: F. Swain. Eng Rec 71:261-2 F 27 '15 Effect of architects' license laws upon engineers. Eng N 73:382-3 F 25 '15 Eminent members of profession discuss present standing of engineers. Eng Rec 71:361-4, 390-2 Mr 20-27 '15 Engineer at practical idealist. C: D. Marx. Eng Rec 72:378-80 S 25 '15 Engineer and publicity, with special refer-

Engineer and publicity, with special reference to the publicity work of the Cleveland engineering society; abstract. C. E. Drayer. Eng & Contr 42:574-5 D 23 '14; Abstract, with discussion. Am Soc M E J 37:88-92 F '15

Engineer awakes; abstracts. F. H. Newell. Eng & Contr 44:221-3 S 22 '15; Eng N 74:568-70 S 16 '15; Power 42:459-60 S 28 '15; Eng Rec 72:420-1 O 2 '15

Engineering contractor, H. P. Gillette, Eng & Contr 44:315-17 O 20 '15

Engineering positions in Illinois with state highway commission and with state utilities commission. Eng & Contr 43:421 My 12 '15

Engineers and public service. M. E. Cooley. Elec Ry J 45:1158-9 Je 19 '15

Engineers and public-service commissions. Eng N 74:247-8 Ag 5 '15

Engineers as arbiters of public equity and justice. W. M. Daniels. Eng Rec 70:623-4 D 5 '14

Engineers as members of public service commissions. C: H. Ledlie. Eng N 73:547-8 Mr

18 '15
Engineers from the contractor's viewpoint.
R: W. Sherman. Eng N 72:1138 D 3 '14
Engineer's idea of values is usually confused;
Prof. John R. Commons's views. Eng & Contr
43:284 Mr 31 '15
Engineers present open letter to chairman of
New York constitutional convention. Elec
R & W Elec'n 67:484 S 11 '15
Engineers' salesmanship. A. H. Pohlman.
Power 41:723-4 My 25 '15
Engineers will discuss plans for nation-wide
cooperative movement. Eng Rec 71:766-7 Je
19 '15

Experience of an engineer in public office. M. L. Cooke. Am Soc M E J 37:708-9 D '15 Factors in municipal engineering: abstracts. M. L. Cooke. Am Soc M E J 37:81-7 F '15; Eng Rec 70:644-5 D 12 '14; Discussion. Am Soc M E J 37:81-7 F '15; Eng Rec 70:644-5 D 12 '14; Discussion. Am Soc M E J 37:85-7 F '15
Herbert Spencer, engineer. E. E. Thum. Eng N 73:802-4 Ap 29 '15
How engineers earn fees. W. L. Benham. Eng N 74:372 Ag 19 '15
How engineers earn fees. W. L. Benham. Eng N 74:372 Ag 19 '15
Insurance as an aid to engineers. N. H. Daniels. Boston Soc C E J 2:91-108 Mr '15
Investment banker and the engineer. C: A. Hobein. Assn Eng Soc J 54:237-57 Je '15
Knowledge of affairs needed by engineers. I. O. Baker. Eng Rec 71:722 Je 5 '15
Place of the engineer in modern society. C. A. Adams. Sibley J 29:211-19 Ap '15
Plain truth about leadership. Eng Rec 71:255
F 27 '15
Political economy and the engineer. C. J.

Political economy and the engineer, G: L. Hoxie. Elec W 65:1549-51 Je 12 '15 Position of the engineer; abstracts. I. O. Baker. Eng N 73:1013 My 27 '15; Concrete Cem 7:164 N '15
Practicing engineers and industrial education. F: G. Bonser. Eng N 72:1133-4 D 3 '14
Publicity for the engineer and its importance excepts. C. E. Drayer. Eng N 73:1018-14
My 27 '15; Eng Rec 71:718-19 Je 5 '15
Relation of the architect and the engineer. D. D. Kimball. Heat & Ven 12:13-18 Mr; 26-30 Ap '15
Relations of accountants and engineers ir

Relations of accountants and engineers ir special investigations of various kinds of plants. H. C. Hopson. J Account 20:397-

Requisites for success in engineering, F. H. Fay. Boston Soc C E J 1:249-62 Ap '14 Specialized experience of engineers and contractors vital to country's defense, G: Perrine, il Eng Rec 72:594-6 N 13 '15

Status of the engineer, E. W. Rice, ir. Ger Elec R 18:234-7 Ap '15; Same, Am Inst E E Pro 34:643-50 Ap '15

Status of the engineer; symposium. Am Inst E E Pro 34:635-74 Ap '15; Abstracts: Elec R & W Elec'n 66:391-2 F 27 '15; Efec W 65 494-5 F 20 '15; Eng N 73:409-10, '742 F 25 Ap 15 '15

Taking inventory. Eng & Contr 43:437-8 My 19 '15

Time at hand when the engineering society should awake to its deficiencies; abstracts E. McCullough. Eng Rec 72:421-2 0.2 '15 Power 42:530-1 O 12 '15

University of Wisconsin promotes engineering work without displacing consulting engineer G: R. Bascom. Eng Rec 72:47-8 Jl 10 '15

Value of sales experience to the engineer W: T. Price. Sibley J 30:11-13 O '15
Volunteer engineer officers. Eng & Min : 100:796-7 N 13 '15

See also Civil engineers; Electric engineers; Heating engineers; Locomotive engineers; Mining engineers; Technical writing

## Licenses

Architects versus engineers; Illinois engineer, win fight for legal recognition. Assn. Eng Soc J 54:277-99 Je '15
Hearing on Massachusetts licensing bill Power 41:418-19 Mr 23 '15

Engineers-Licenses-Continued

History of the bill for a structural engineer's license law. A. Allen. W Soc E J 20:390-2

nicense iaw. A. Allen. W Soc E J 20:390-2 Ap '15

Illinois law requires licenses for engineers. Eng Rec 72:71-2 J1 17 '15

License legislation in the United States. A. A. Potter. Power 41:792-3 Je 8 '15

Licensing structural engineers in Illinois. Eng N 74:323 Ag 12 '15

Model boiler and engineers' license law—references. Power 42:166-8 Ag 3 '15

Model boiler-inspection and engineers' license law. Power 42:82-3 J1 20 '15

Pennsylvania license law declared unconstitutional. Power 42:202 Ag 10 '15

Proposed act to provide for the licensing of structural engineers, and to regulate the practice of structural engineering in Illinois. Eng & Contr 43:243-4 Mr 17 '15

Provisions of the Illinois license law for structural engineers. Eng & Contr 44:65-6 J1 28 '15

Cualifications of Montana hoisting engineers

'15
Qualifications of Montana hoisting engineers.
A. L. Street. Power 42:213 Ag 10 '15
Resolution of board of direction of Western society of engineers pertaining to proposed license law for structural engineers. Eng & Contr 43:299-300 Mr 31 '15
Structural engineers' license law in Illinois.
Eng N 74:139-40 Jl 15 '15
Structural engineers' license law of the state of Illinois. W Soc E J 20:530-40 Je '15

#### Salaries

Earnings of graduate and nongraduate engineers. Eng N 74:325, 613 Ag 12, S 23 '15 Grades and compensation for engineers in the employ of the city of New York. Eng Rec 71:804 Je 26 '15

One way to advertise an engineering school. Eng N 74:32-3 Jl 1 '15 Sliding salary scale for city engineers. Eng & Contr 44:117-18 Ag 18 '15 Standardizing engineering positions and salaries in New York city. Eng N 73:54-5 Ja 14 '15

Statistics of the earnings of graduate engineers. Eng N 74:505 S 9 '15 Wages of engineers. E. Pagett. Power 41:18 Ja 5 '15

See also Civil engineers

### Societies

See Engineering societies

Engineers, American association of. See American association of engineers

Engineers, National association of stationary. See National association of stationary engineers

Engineers, State. See State engineers

Engineers' clubs

Ingredients of an engineers' club. A. P. Greensfelder. Assn Eng Soc J 54:1-5 Ja '15

Engines

Census of primary power equipment, diag Elec W 65:215-16 Ja 23 '15 Economic selection of prime movers. R. Trautschold. Power 42:511-13 O 12 '15 Gas and steam engines and the turbine. J. E. Johnson, jr. Iron Age 95:626-9 Mr 18 '15; Same. Sci Am S 79:294-5 My 8 '15 N. E. L. A. committee report on prime movers. Elec W 65:1512-13 Je 12 '15; Elec R & W Elec'n 66:1111 Je 12 '15 Present status of prime movers. H. G. Stott, R. J. S. Pigott and W. S. Gorsuch. Am Inst E E Pro 33:953-86 Je '14; Abstract. Elec R & W Elec'n 65:31-2 Jl 4 '14; Abstract. Elec R Ry J 44:72-4 Jl 11 '14; Discussion. Am Inst E E Pro 34:85-102 Ja '15 Prime movers in American plants. A. A. Potter and W. A. Buck. Elec W 65:668-9 Mr 13 Recent developments in prime movers. W. E

Recent developments in prime movers. W. F. Durand. Elec W 65:19-21 Ja 2 '15

Uniformity of running of prime movers and its experimental determination: abstract. Bonin. Am Soc M E J 37:48 Ja '15

See also Aeroplane motors; Air engines; Automobile engines; Blowers; Crankpins; Crankshafts; Fire engines; Fuel; Gas and

oil engines; Gas turbines; Governors (machinery); Heat engines; Locomotives; Marine engines; Pistons; Pumping engines; Pumps; Steam engines; Steam turbines; Tractors; Turbines

#### England

## Coast raids

Engineers and the Hartlepool raid. Engineer 118:610 D 25 '14

English language

nglish language
Bettering the use of English. S: C. Earle. Elec
Ry J 45:94 Ja 9 '15
How we got our alphabet. W. Rice. Inland Ptr
55:234-5 My '15
Possessive case. Inland Ptr 54:645-6 F '15

See also Compound words: Proofreading: Punctuation

English language (for foreigners)
Teaching English to foreigners in industry. P:
Roberts. Am Ind 16:24-6 O '15

Engraving

Process engraving. S. H. Horgan. monthly numbers of the Inland printer H.

See also Engraving machines; Etching; Lithography; Photoengraving

Engraving and printing, Bureau of. See United States—Engraving and printing, Bureau of

Engraving machines Gorton universal engraving machine. il diags Mach 21:585-7 Mr '15

Ensilage

Chemical changes during silage formation. R. E. Neidig. Am Chem Soc J 36:2401-13 N

Occurrence of methyl alcohol in corn silage. E. B. Hart and A. R. Lamb, Am Chem Soc J 36:2114-18 O '14

Envelop sealer

Envelop sealer of the pension office, il Sci Am 112:162 F 13'15

Envelops

Window envelopes, Illum Eng Soc 10:394-6 no

Enzymes

Behavior of enzymes at low temperatures. J. S. Hepburn. J Fr Inst 179:581-5 My '15 Enzymes of the central nervous system. H. M. English and C. G. MacArthur. Am Chem Soc J 37:653-64 Mr '15 Enzymes present in alfalfa; alfalfa investigation. C. A. Jacobson and A. Holmes. Am Chem Soc J 36:2170-82 O '14 Enzymes: the synthetic and hydrolytic oxynitrilase. V. K. Krieble. Am Chem Soc J 37: 2205-13 S '15 Function of enzymes S: C. Present. Sci. Am

trilase. V. K. Krieble. Am Chem Soc J 37: 2205-13 S '15
Function of enzymes. S: C. Prescott. Sci Am S 79:67 Ja 30 '15
Retention of activity by urease and by oxidase after exposure to the temperature of liquid air. J. S: Hepburn and C: B. Bazzoni. bibliog J Fr Inst 180:603-5 N '15
Starch-forming enzyme from malt: its action on the hemicelluloses and its commercial application to brewing. C: B. Davis. il J Ind & Eng Chem 7:115-18 F '15
Studies on enzyme action; some experiments with castor bean urease. K. G: Falk and K. Sugiura. Am Chem Soc J 36:2166-70 O '14
Studies on enzyme action: the esterase and lipase of castor beans. K. G: Falk and K. Sugiura. Am Chem Soc J 37:217-30 Ja '15
Studies on enzyme action: the lipase of soy beans. K. G: Falk. Am Chem Soc J 37:649-53 Mr '15
See also Digestive ferments

See also Digestive ferments

Eoliths

Were the eoliths made by man? il Sci Am 112:366 Ap 17'15

Epicassit

New method of tin lining or coating. Eng & Contr 42:468-9 N 11 '14

Description of Equitable building, ley York city
Description of Equitable building, il plans
Arch & Bldg 47:165-78 My '15
Fire prevention measures in the Equitable
building, E: R. Hardy, il Arch & Bldg 47:
179-83 My '15
Lighting the Equitable building, F. L. Godinez, Arch & Bldg 47:188-90 My '15

Equitable building New York city—Continued Mechanical plant of the Equitable building. il plan Arch & Bldg 47:191-5 My '15
Power plant of the new Equitable building. il Elec W 66:81-5 Jl 10 '15
Rooms of the Bankers' club of America. il Arch & Bldg 47:184-7 My '15

Erection of bridges. See Bridges-Erection

#### Erepsin

Studies on the action of erepsin, F. E. Rice. Am Chem Soc J 37:1319-33 My '15

### Erie, Pennsylvania

## Floods

Concrete work withstands severe tests in the Eric flood, L. R. Ferguson, il Concrete Cem 7:148-50 O '15 Destruction wrought by Eric flood, il Elec W

Destruction wrought by Erie flood, il Elec W 66:489-92 Ag 28 '15 Erie can remove flood menace by spending \$798,000 on Mill creek improvement. F. Gannett. il diags map Eng Rec 72:440-2 O 9 '15 Erie flood-protection report. diags Eng N 74: 937 N 11 '15

337 N 11 15 Erie rainstorm and flood, il map Eng N 74: 326-9 Ag 12 '15 Restricted stream channel responsible for Erie flood damage. T. E. Seelye. il Eng Rec 72: 186-9 Ag 14 '15

## Water supply

Erie waterworks improvements, il Munic J 39:358-9 S 2  $^{\prime}15$ 

Erie barge canal. See New York state barge canal

Erosion

cause and prevention of storm erosion on Gulf coast. G. O. Case. il Eng N 74:1072-5 D 2 '15 Coast erosion and protection on Long Island and New Jersey. G. O. Case. map Eng N 74: 348-51, 388-91, 438-42 Ag 19-S 2 '15 See also Valleys

Eskimos Aglait illunainortut Okiok, Labradoreme. A. W. Birdsall. il Inland Ptr 54:679-80 F '15

Essential oils

Blue hydrocarbon occurring in some essential oils. A. E. Sherndal. Am Chem Soc J 37:167-71 Ja '15

Contributions of the chemist to the perfumery and essential oil industry. E: T. Beiser. J Ind & Eng Chem 7:936-7 N '15
Hydrogen number of some essential oils and essential oil products; oils of sassafras, anise, fennel, clove and pimenta. A. R. Albright, il diags Am Chem Soc J 36:2188-202

Oil of ocymum pilosum Roxb. K. Bhaduri, Am Chem Soc J 36:1772-3 Ag '14

Volatile oil of calycanthus floridus. E. R. Miller, G. W. Taylor, and M. H. Eskew. Am Chem Soc J 36:2182-7 O '14

Volatile oils of the genus solidago. E. R. Miller and J. M. Moseley. Am Chem Soc J 37:1285-94 My '15

Volatile oils of the genus solidago. E. R. Miller and M. H. Eskew. Am Chem Soc J 36: 2538-41 D '14

See also Citrus oils; Perfumery

Esterification

Esterification of benzoic acid by mercaptans.

L. S. Pratt and E. E. Reid, diag Am Chem
Soc J 37:1934-48 Ag '15

Determination of volatile esters in citrus oils and extracts. A. R. Albright and C: O. Young. Am Chem Soc J 37:2382-7 O '15

Esters, as well as the monomolecular β- and γ-lactones, of d-mannonic and d-gluconic acids; on ortho-bis-d-galactonic acid, d-galactonic γ-lactone and its mono-hydrate. O. F. Hedenburg. Am Chem Soc J 37:345-72 F '15

New hydroxyurethanes and chromoisomeric silver salts of their acyl derivatives, L. W: Jones and R. Oesper. Am Chem Soc J 36: 2208-23 O '14

See also Chlorobenzoylacetic esters

#### **Esthetics**

See also Art

Estimates

stimates
Contractors' office forms and systems. M. J.
Lavalle. Elec R & W Elec'n 67:62-3 Jl 10 '15
Do you estimate or guess in bidding? S. Stern.
Metal Work 83:44-5 Ja 1 '15
How quantity competition can be eliminated.
H. M. Saumenig. Eng Rec 72:566 N 6 '15
Modern estimating methods. A. A. Dowd. il
diags Mach 21:463-9 F '15
Selling price of castings. A. O. Backert. Iron
Tr R 56:228-30+ Ja 28 '15

See also Engineering-Estimates: Quantity surveying

Etching

Etching by the transfer process. il Metal Ind n s 13:6-8 Ja '15

n s 13:6-8 Ja '15
Etching reagents suitable for particular
metals and alloys. O. F. Hudson. Eng &
Min J 99:1120 Je 26 '15
How to detect phosphorus in steel. W. T.
Stead, il Iron Tr R 57:989-90 N 18 '15
How to select etching reagents. O. F. Hudson.
il Iron Tr R 57:216-20 Jl 29 '15

See also Engraving

Etchings

Portfolio of etchings. R. F. Seymour. Arch

Rec 38:489-96 O '15
Six etchings of Brooklyn bridge, by H. De Ville; text by M. Stapley. Arch Rec 38:583-91 N '15

Six etchings of European iron and steel works. J. Pennell, Iron Tr R 56:57-64 Ja 7 '15

Ethane

thane
Separation of ethane and ethylene by fractional distillation in a vacuum at low temperatures, G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:896-902 Ap '15
Vapor pressure of ethane and ethylene at temperatures below their normal boiling points. G. A. Burrell and I. W. Robertson. diags Am Chem Soc J 37:1893-1902 Ag '15

Etherometer Apparatus for mechanical administration of anaesthetics, il Sci Am 113:471+ N 27 '15

Action of aluminium chloride on the aliphatic ethers. G. B. Frankforter and E. A. Daniels. Am Chem Soc J 37:2560-7 N '15 Derivatives of phenyl ether. A. N. Cook and F. F. Sherwood, Am Chem Soc J 37:1835-9 Ag '15

On the oxidation of ether, R. M. Isham and C. E. Vail. Am Chem Soc J 37:902-6 Ap '15 Rate of evaporation of ether from oils and its application in oil-ether colonic anesthesia. C: Baskerville, J Ind & Eng Chem 7:868-70 O '15

Ethiopia

## Antiquities

Meroë the royal city of Ethiopia. Sci Am S 79:98 F 13 '15

thylene
Separation of ethane and ethylene by fractional distillation in a vacuum at low temperatures. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:896-902 Ap '15
Studies in catalytic hydrogenation; a new method of hydrogenation of volatile substances and the rate of hydrogenation of ethylene. J. B. Rather and E. E. Reid. Am Chem Soc J 37:2115-18 S '15

Vapor pressure of ethane and ethylene at temperatures below their normal boiling points. G. A. Burrell and I. W. Robertson. diags Am Chem Soc J 37:1893-1902 Ag '15

Etiquet

See also Courtesy

Eucalyptus globulus Eucalyptus oil industry of California. P. W. Tompkins. J Ind & Eng Chem 7:995-7 N '15

Investigations on the oil of eucalyptus globu-lus of California. C; E. Burke and C; C. Scalione. il J Ind & Eng Chem 7:206-9 Mr

Eugenics

Eugenics and war. Sci Am S 79:230 Ap 10 '15 Protection of the strong; working of German insurance laws for the protection of the poor, Sci Am S 79:343 My 29 '15 Euler formula

Curves for strength and deflection of very long columns. E. L. Robinson. Eng N 73:1108-9

Euphrates river

Hindia dam on Euphrates river, il diags plan map Eng Rec 71:24-5 Ja 2 '15

European war, 1914-Achilles' heel of Germany. Sci Am 113:154 Ag 21 '15 deception in war. il Sci Am 112:124+

Art of Atrocities in the scholars' war. Sci Am 113:38

JI 10 '15

Defense of Belgium by inundation. P. Sallior. Il map Sci Am S 79:166 Mr 13 '15

Foresters in the great war. S: T. Dana. il Am For 20:585-87 D '14

Germany's grip on French steel works. E. Schrödter. Eng M 49:733-4 Ag '15

Glasgow railway men as soldiers. il Elec Ry J 45:47-9 Ja 2 '15

Great achievements of German state railroad lines. F: W: Wile. Ry Age 59:428-30 S 3 '15; Same. Sci Am S 80:218-19 O 2 '15

Lessons of the present war from a technical point of view. H. Maxim, Sci Am 112:453 My 15 '15

Railroad soldier at the front W. C. 11.

Railroad soldier at the front, W. S. Hiatt. Ry Age 59:811-12 O 29 '15 Review of the year 1914; army and navy. Sci Am 112:6 Ja 2 '15 Ups and downs of war. Sci Am 111:502 D 19 '14

See also Lusitania (steamship)

## Aerial operations

Aeronautic lessons of the European war.
C. Dienstbach. il Sci Am 112:627+ Je 26 '15
Aeronautics in 1914. Engineer 119:7-8 Ja 1 '15;
Excerpt. Sci Am S 79:114 F 20 '15
Captive balloons on the French front. N. Truslow. Sci Am 113:181 Ag 28 '15
Cost of the war in airsilips; summary of the airship losses of the central empires.
L. d'Orcy, il map Sci Am 113:294+ O 2 '15
European war from an engineer's standpoint.
J: B. C. Kershaw. il diags Eng M 48:498-507
Ja '15
Loss of Zeppelins. Sci Am 112:95 Il 21 '15

Loss of Zeppelins. Sci Am 113:95 Jl 31 Progress in aeronautics; a review of recent air-raids and what they have accomplished. H. Bannerman-Phillips. Sci Am S 79:250-1 Ap 17 115

War experiences of an air scout. F: C. Hild. il Sci Am 111:520+; 112:20+, 51+ D 26 '14-Ja 9 '15

eppelin and aeroplane raids. Engineer 120: 265-6 S 17 '15Zeppelin

Zebb-6 S 17 15
Zeppelin question; facts and figures indicating the number and capacity of the air fleet.
G. Prade. Sci Am S 79:214-15 Ap 3 '15
Zeppelin raid on Paris. C. Dienstbach. Sci Am 112:332 Ap 3 '15
Zeppelins. Engineer 120:227-8 S 3 '15

Campaigns and battles
Battle of the Marne. W. S. Hiatt. Ry Age 59:
26-8 Jl 2 '15; Abstract. Eng M 50:108-9 O

Table 10, Abstact. Eng at 30.105-3 O Campaigning in winter. Sci Am 111:461 D 5 '14 First year of the great war; a review of the operations in all theaters of war. M: E. Hanna. il Sci Am 113:110-11+ Ag 7 '15 Geographic aspects of the war. D. W. Johnson. diag Sci Am S 80:194-5, 222-4 S 25-O 2 '15 Strategic moves of the war. Sci Am 111: 265, 306, 322+, 338+, 350, 378, 410, 422, 438-9, 454, 490, 506, 522+; 112:590-1, 609, 628; 113: 28, 42, 62, 78, 94, 140-1, 155-9, 180, 198+, 234, 248, 270, 290, 320+, 338, 358, 378, 396+, 426, 466+, 486+, O 3-D 26 '14; Je 12-Jl 31, Ag Strategic positions of the contending armies. Sci Am 112:428 My 8 '15

## Causes

Economic causes of the war traced to mush-room growth of German industries. H. Hau-ser. Automobile 33:382-5 Ag 26 '15

## Commercial and financial aspects

America and Brazil in the war crisis. M. Summers. Metal Work 82:762 D 11 '14 British engineering firms after the war. Engineer 120:392-3 O 22 '15

British India. U S Sp Cons Rep 72:490-503 '15 Chemical trade and the war. Engineer 120: 379 O 22 '15

379 O 22 '15
Doing without Europe. Sci Am 112:128, 157+, 176, 196 F 6-27 '15
Effect of the war on American industries. E: E. Pratt. Sci Am 113:203, 230-1 S 4-11 '15
Effect of the war on regulation of public utilities. N. T. Guernsey. Elec W 65:12-14 Ja 2

Effect of the war upon the American chemical industries. J. H. James, Eng Soc W Pa 31: 381-400; Discussion, 31:400-16 Je '15 Electrical industry in England, H. Harrison, Elec W 65:974 Ap 17 '15 England's colonies and the war. Am Ind 15: 40 Ap '15

40 Ap '15
European war and the lumber trade, R. C. Bryant, Am For 20:881-6 D '14
Financial developments in South American countries. W: H. Lough, U S Bur For & Dom Com 103:1-42 '15
Foreign competition after the war. Engineer 119:557-8 Je 4 '15
Future prospects of the electrical export business. M. A. Oudin. Elec W 65:14-15 Ja 2 '15

ermany's preparations for the industrial struggle after the war. Engineer 120:368-9 O Germany's

American industry may be hampered How through a depleted money market and an embarrassment of credits. Am Ind 15:17 Ap

'15
Industrial energy as a military weapon. J. R. Finlay. Met & Chem Eng 13:547-50 S 1 '15
Influence of the European war on the mining industry of Dutch Guiana. F. B. Percival. Eng & Min J 99:445 Mr 6 '15
Influence of the war on the automobile industry. H: W. Perry. il Sci Am 113:206-8 S 4 '15
Interest rates on public utility bonds. H. S. Welsh. Elec Ry J 45:137-8 Ja 16 '15
Italian cotton industry since the European war. R. Sansone. Textile World 49:501-3 Ag '15

'15
Lessons of the war; after-the-war policy. Engineer 120:414-15 O 29 '15
Nickel, copper and mercury as affected by the war. J Ind & Eng Chem 7:71-2 Ja '15
Non-ferrous metals and the war. W. R. Ingalls, Iron Age 96:420-1 Ag 19 '15
Results of the war for public service commissions to consider. H; Floy. Elec W 65:15-16 Ja 2 '15
Seed supply and the war G. E. Mitchell il Sci.

16 Ja 2 '15
Seed supply and the war. G. E. Mitchell. il Sci
Am 111:488 D 12 '14
Solving some war order problems. E. C.
Kreutzberg, il Iron Tr R 57:483-6+ S 2 '15
Tasks of German inventors in wartime. Sci
Am 113:214+ S 4 '15
War and its bearing upon contracts and trade.
A. Del Mar. Eng M 50:18-27 O '15
War and lumber. Sci Am 113:194 S 4 '15
War and our chemical industries; symposium;
with discussion. J Ind & Eng Chem 7:59-64
Ja '15

War and our metals, L. O. Kellogg, Eng M 49: 18-27 Ap '15 18-27 Ap

War and the British engineer. Engineer 118: 203-4, 226-7, 249, 282-3, 304-5, 372-3, 512-13; 119:114-15 Ag 28-S 25, O 16-N 27 '14, Ja 29

War and the chemical industry. W: H. Nichols. J Ind & Eng Chem 7:131-6 F '15

War and trade losses of overseas countries. Am Ind 16:45 O '15

War orders and American industry. Eng M 49:481-8 Jl '15

Zinc corporation and the war. Eng & Min J 100:95-7 Jl 17 '15

## Cost

Economics of the war. Eng & Min J 99:398

Destruction of property

Architect's impressions in Belgium. E. T. Richmond. il Am Inst Arch J 3:153-8 Ap '15 Destruction of architectural monuments in Belgium. R. A. Cram. An Inst Arch J 3:185-6 Ap '15

reat war's destruction of French f J. P. Alaux, il Am For 21:155-68 Mr

Report of a German commission upon the destruction of architectural monuments in Belgium. R. D. Kohn. Am Inst Arch J 3: 130-2 Mr '15
Without knowing why. Am Inst Arch J 3: 198-200 My '15 European war-Destruction of property-Cont.

## Maritime law

Blockade by submarine. Sci Am 112:376 Ap 24

Medical and sanitary affairs

Bath trains of the Russian army, il Sci Am 113:13 Jl 3 '15; Same. Metal Work 84:363-4 S 17 '15

Deaf-mutism produced by shock. Sci Am S 80:

Dear-mutism produced by snock. Sci Am S 80: 336 N 20 '15 Educating invalid soldiers. A. Gradenwitz. il Sci Am 113:229 S 11 '15 Exposition of military sanitation; showing how the sick and wounded are cared for. A. Gradenwitz. il Sci Am S 79:316-17 My 15 '15

Letters from the firing line: the care of the wounded. X. Sager. il Sci Am 111:510+ D 19

Roentgenology in war. il Sci Am S 79:68 Ja 30

See also European war—Relief work; Hospital cars; Hospital trains

## Military equipment

Ammunition and finance in the present war. Sci Am 112:604 Je 19 '15
Austria's famous Skoda mortars, il Sci Am 113:12 Jl 3 '15
Blowing up barbed wire entanglements: the poles bearing explosives used by the French, Russian and English armies, il Sci Am 111:

46.50 10 5 '14
Electricity in the war, il Elec R & W Elec'n 67:76-8 Jl 10 '15
European infantryman's rifle, E: S. Crossman, il Sci Am 112:398-9 My 1 '15
European war from an engineer's standpoint, J. B. C. Kershaw, il Eng M 49:43-50 Ap '15
Flying machines of the warring powers, J; J, Ide, diags Sci Am 112:226-7+ Mr 6 '15
French mount 75mm, gun on 30 hp, chassis, W. F. Bradley, il Automobile 32:305-9 F 18

Military tactics and the motor, il Sci Am 112:8-9+ Ja 2 '15
Motor trucks and modern warfare. J. Brinker. il Sci Am 113:398-9+ N 6 '15
Munition metals. H. C. H. Carpenter. Sci Am 88:02:62-3 O 23 '15; Abstract. Eng M 50:112-

Russian bath trains, Ry Age 58:378-9 F 26 '15 War uses of the motorcycle: cycle ambulance and motor machine gun. il Sci Am 112:138+ F 6 '15

See also Automobiles in war

## Naval operations

Action in which the Carmania sank the Cap Trafalgar, il Sci Am 111:449 D 5 '14 Battle of the North sea, il Sci Am 112:136-7 F

Battle of the North sea. il Sci Am 112:136-7 F 6 '15
Forcing the Dardanelles. il map Sci Am 112: 244, 264-5, 316-17 Mr 13-20, Ap 3 '15
Hitting an invisible ship at a ten-mile range. il Sci Am 112:218-19 Mr 6 '15
Loss of the pre-dreadnought Bulwark. il Sci Am 111:489 D 12 '14
Naval lessons of the war. H. M. Kennard. Sci Am 112:473 My 22 '15
Russian naval victory in the Baltic. il Sci Am 113:209 S 4 '15
Sinking of the German Pacific squadron. il Sci Am 112:25 Ja 2 '15
Some recent naval operations. Sci Am 111:518
D 26 '14
Twelve months of the great naval war; how the British fleet has justified its existence.
J. B. Walker. il Sci Am 113:108-9+ Ag 7 '15
War of attrition. Sci Am 112:376 Ap 24 '15

War of attrition. Sci Am 112:376 Ap 24 '15
When the German fleet comes out. Sci Am
112:586 Je 12 '15
Wrecking of the cruiser Emden by shell fire.
il Sci Am 113:376 O 30 '15

See also European war-Submarine operations; Lusitania

Neutral powers

Shall there be a neutral coalition? Sci Am 113: 462 N 27'15

## Peace and mediation

Organized efforts to bring about peace. F: W. Kelsey. Sci Am 111:491 D 12 '14

## Personal narratives

Forests in the Russian war zone. S. Washburn. il Am For 21:755-67 JI '15
In and out of the Caucasus in war time. L. C. David. il Eng & Min J 99:477-80 Mr 13 '15
In the wake of war. W. F. Bradley. il map Automobile 32:483-8 Mr 18 '15
War experiences of an air scout. F: C. Hild. il Sci Am 111:520+; 112:20+, 51+ D 26 '14-Ja 9 '15

#### Prison life

Science in German concentration camps. A. Gradenwitz. il Sci Am 113:10-11 Jl 3 15

#### Relief work

Relief work

Herbert Clark Hoover and American relief
work; abstract. W. Irwin. Eng & Min J 99:
243-4 Ja 30 '15

Herbert Clark Hoover, the rescue specialist. por Eng & Min J 99:935-6 My 29 '15

Motion study for the crippled soldier. F. B.
Gilbreth. il Am Soc M E J 37:669-73; Discussion. 37:673-5 D '15

Stretcher hammock and stretcher chair. N.
Truslow il Sci Am 113:342+ O 16 '15

Training of the war's maimed, halt and blind.
il Sci Am 113:401+ N 6 '15

See also European war—Medical and santa-

See also European war-Medical and sanitary affairs

## Results (forecasts)

Amateur prophecies. Sci Am 113:226 S 11 '15

# Submarine operations

Missing! Sci Am 113:422 N 13 '15 Submarine as a commerce destroyer, il Sci Am 112:395 My 1 '15

European war and science England's tardy recognition of applied science, W. R. Whitney, J Ind & Eng Chem 7:819-22 O '15 Influence of the war on science. Sci Am 113: 462 N 27'15

462 N 27 '15' Science in the war on science. Set Am 115. Science in the war and after the war. J. A. Fleming. Sci Am S 80:338-9 N 27 '15; Same cond. Engineer 120:336-7 O 8 '15

Evans museum and dental institute. See Pennsylvania. University

Evanston, Illinois

Water supply
Rapid filter plant at Evanston. L. Pearse. il
plans Am Water Works Assn J 2:160-79 Mr
15

Evaporation

Heat of vaporization of normal liquids. J. Kendall. diag Am Chem Soc J 36:1620-30 Ag '14 Sugar-house evaporating apparatus; abstracts. E. W. Kerr, J. F. Gunther and W. A. Tolsten. Met & Chem Eng 13:485-92, 506-7 Ag

See also Distillation; Drying

## Evaporators

Condensers for evaporating apparatus. E. W. Kerr. diags Met & Chem Eng 13:551-7 S 1

Failure of evaporators. W. B. Tardy, Int Marine Eng 20:509-11 N '15

## Évasé stack

Mechanical draft and the évasé stack, A. M. de Bellis, diags Eng M 49:525-34 Jl '15

Evening and continuation schools

Bit of South America in Wisconsin; the use and flexibility of the continuation school. H. E. Miles. Am Ind 15:28 Mr '15 Pennsylvania's new compulsory continuation schools. H. E. Miles. Am Ind 16:28-9 N '15

Evergreens Ornamental evergreens. W. H. Miller. il plans Am For 21:916-21 S '15

See also Coniferae; also names of special evergreen shrubs and trees, e. g. Douglas fir; Fir; Pine

Evidence

Verdict of the insects as to time of death. D. Waterson. Sci Am 113:11 Jl 3 '15

See also Identification

Evolution

Some questions of evolution, E. B. Wilson, Sci Am S 79:215 Ap 3 15

See also Variation (biology)

Examinations. See Civil service—Examinations; Electric engineering—Examinations; Mining engineering-Examinations

Excavating machinery
Albrecht excavator and loader. il Concrete
Cem 7:125 S '15

Cem 7:125 S '15
Brownhoist-Shnable patent drag line bucket.
il Ry R 57:249-50 Ag 21 '15; Eng N 73:1231-2
Je 24 '15; Eng & Contr 43:580-1 Je 30 '15; Ry
Age 59:125-6 Jl 16 '15
Cost of excavating drainage ditches with steam
and electric machines. Eng Rec 70:704-5 D

Dragline cableway excavator, il Eng Rec 70: sup279 D 5 '14
Dragline cableway is an effective tool for sand and gravel plants, il Eng Rec 71:716-18 Je 5 '15

Dragline excavates 70.854 cubic yards per month, il Eng Rec 71:27 Ja 2 '15
Dragline excavator with wagon loader, il Eng N 73:76 Ja 14 '15
Drag-line excavators with high-duty machinery. Eng Rec 71:429-30 Ap 3 '15
Drag-line machine for nitrate. J: G. Beck, il Eng M 49:429 Je '15
Dredge walks along over trench, il Eng N 74: '412 N 11 '15
Earth-moving with electric dragline excava-

942 N 11 13 Earth-moving with electric dragline excavators. Eng N 73:1183 Je 17 '15 Electric dragline excavates 60,000 yd. in 18 days. Eng & Min J 100:882 N 27 '15 Excavating aggregates with drag line and hauling by motor truck on Indiana concrete road work. S. E. Bates. il plans Eng & Contr 44:231-3 S 22 '15 Excavating and backfilling sewer trenches by machine. Eng Rec 71:20-1 Ja 2 '15 Excavating machine that walks. il diag Sci Am 11:298 Jl 17 '15 Excavating machinery used in land drainage.

Excavating machinery used in land drainage. D. L. Yarnell, il diags U S Agric Bul 300: 1-37 '15

Gasoline engine shovel for light excavation. il Eng & Contr 44:152-3 Ag 25 '15
Home-made clamshell excavator of 1877. L.
Goodday, il diag Eng N 74:78-9 Jl 8 '15
Largest electric dragline excavator, il Eng &
Contr 42:547 D 9 '14
Light power excavators, il Sci Am S 78:405 D

McCormick bottomless drag line excavator. il Eng & Contr 44:56 Jl 21 '15
Methods and cost of levee enlargement with a tower dragline excavator. il diags Eng & Contr 43:417-20 My 12 '15; Excerpt. Eng M 49:598-9 Jl '15
Mot

M 49:598-9 JI '15
Motor-driven drag-line excavators for constructing headwater diversion channel, il Elec W 65:934 Ap 10 '15
Moving dirt with gasoline, il Sci Am 113:185
Ag 28 '15
Myers-Whaley machines on the Rand, il Eng & Min J 99:150-1 Ja 16 '15
New trenching machines, il Eng N 74:448-9
S 2 '15
New type of graph il Engineer 118:608 8 75.

New type of grab. il Engineer 118:602-3 D 25

New type of traveling excavator for ditches. W. W. Patch. il Eng Rec 70:643 D 12 '14 Power scraper-excavator, il Eng N 73:542-3 Mr

18 '15
Sewer construction in Chicago, Ill., with a ladder type excavator, S. E. Bates. il Munic Eng 19:193-5 N '15
Stripping with dragline excavators. Eng & Min J 100:136-7 S 11 '15
Track-trench excavating machine. il Elec Ry J 46:14 Jl 10 '15
Trench excavators: four models—steam, gasoline or electric drive. diags Munic J 38:522-3 Ap 15 '15

See also Dredges; Dredging machinery; Electric shovels; Mining machinery; Rock drills; Steam shovels

Excavation

xcavation
City tunnel of the Catskill aqueduct. W. E. Spear, diags Eng N 73:148-53 Ja 28 '15
Court decision on the inviolability of test boring records. Eng & Contr 43:416-17 My 12 '15
Derrick-trolley carries dirt beyond caving banks, M. A. Milliff, diags Eng Rec 72:674 N

Diagram for computing rock in sewer trenches. C. A. Bryan, Eng N 73:1081-2 Je 3 '15 Dragline fills in ahead of itself for its own track. L. C. Heilbronner, il Eng Rec 72:365 S

Excavating and timbering the very deep trenches required in reservoir and other dam construction. J. M. M. Greig, plans Eng & Contr. 44:176-8 S. V. 15.

Excavating plant for heavy drainage work in Arkansas. il Eng Rec 71:41 Ja 9 '15.

Excavation for foundation of Elephant Butte dam. E. H. Baldwin, il diags plan Eng N. 73:49-54 Ja 14 '15.

Hydraulic mining cartridge. J. Boxen S. 1.

nam. P. H. Bandwin. It chags plan Eng N 73:19-54 Ja 14 '15
Hydraulic mining cartridge. J. Tonge. il diags Sci Am S 79:156-8 Mr 6 '15
Method of excavating for the foundation of a bank building in Stockholm, Sweden. K. P. Billner. diags Eng & Contr 44:112 Ag 11 '15
Methods and cost of levee enlargement with a tower dragline excavator. il diags Eng & Contr 43:417-20 My 12 '15
Methods of excavation for buildings. A. B. McDaniel. il diags Eng Rec 71:68-71; tables p 69, 71 Ja 16 '15
Misleading boring records are grounds for recovery of damages by contractors. Eng Rec 71:554-5 My 1 '15
New York rapid transit railway extensions. F. Lavis. il diags Eng N 72:1104-9 D 3 '14
Preliminary estimating of canal excavation. L: M. Hammond. Eng Rec 71:146-7 Ja 30 '15
Stripping of gravel pits by hydraulic methods. W. H. Wilms. diags Ry Age 58:1430-3 Je 18 '15

Task and bonus work applied to excavation. Concrete Cem 5:243 D '14

See also Blasting; Dredging; Earthwork; Electric shovels; Excavating machinery; Shaft sinking; Street openings; Subways; Subways (streets); Trenches; Tunnels and tunneling

Cost

Conditions determining maximum grades and methods and cost of road grading in West Virginia. A. D. Williams. Eng & Contr 43: 16-17 Ja 6 '15; Excerpt (Cost of grading and excavating). Concrete Cem 5:267-8 D '14 Cost of excavating abutments and wing-walls for a street bridge. H. R. Ferriss. Eng & Contr 44:14 J1 7 '15 Cost of excavating drainage ditches with steam and electric machines. Eng Rec 70:704-5 D 26 '14

and electric machines. Eng Rec 70:704-5 D 26
'14
Cost of initial mining excavations. E. D. Gardner. Assn Eng Soc J 54:210-19 My '15
Cost of mine openings. E. D. Gardner. Eng &
Min J 100:791-4 N 13 '15
Costs of electric shovel work at Cleveland.
il Elec Ry J 44:1261-2 D 5 '14; Same. Elec
R & W Elec'n 66:172-3 Ja 23 '15
Ditch dug with dynamite at 15 cents per cubic
yard. Eng Rec 72:673 N 27 '15
Dredges and excavating machinery. H. W.
Rogers. Am Inst E E Pro 34:3035-9 D '15
Earth excavated for less than six cents per
yard in District no. 9, Mississippi county,
Arkansas. Eng Rec 71:176 F 6 '15
Excavation by Cleveland railway co. il Ry R
56:67-8 Ja 9 '15
Methods and costs of electric shovel work removing slides and side cutting for electric
railway, diags Eng & Contr 43:154-5 F 17 '15
Methods of excavation for buildings. A. B.
McDaniel il diags Eng Rec 71:184-71; tables
p 69, 71 Ja 16 '15
Operation analysis of new machines which
cheapen the moving of earth on road work.
A. B. McDaniel. il Eng Rec 72:126-8 JI 31
'15
Rapid trench excavation at Canadian camp

Rapid trench excavation at Canadian camp follows war's call, il Eng Rec 71:182 F 6 '15 Reducing the cost of drainage excavation. Eng Rec 70:693-4 D 26 '14 Trench spoil moved cheaply by tractor-trailer trains. il Eng N 74:842-3 O 28 '15

Excavation—Cost —Continued

xcavation—Cost —Continuea Unit costs of and organization for building site excavation. W: W. Hay. Eng & Contr 43:453-4 My 19 '15 Unit costs of steam shovel work in Cuba. J. M. Bischoff. Eng & Contr 44:276-8 O 6 '15

See also Earthwork-Cost

Excavation, Subaqueous

Subaqueous rock excavation. C: C. Phelps. il Eng N 74:968-73, 1020-4, 1062-7 N 18-D 2 '15

Exclusive agencies. See Sales

Executive's problem; an analysis of what is involved in different forms of management. G: D. Babcock, Iron Age 96:419 Ag 19 '15

Exhaust fans, See Fans, Exhaust

Exhaust steam

Combination electric heating plant, Laramie, Wyo, A. E. Anderson, il Power 42:602-5 N 2

'15
Commercial value of exhaust steam. A. L. Johnston, jr. Eng M 49:327-33 Je '15
District heating with open heater. T: Wilson. il plan Power 42:44-7 Jl 13 '15
Does it take a greater amount of heat initially to heat with live steam than with exhaust steam? I. N. Evans. Heat & Ven 12:39-43 Ja

Engine condensation, with particular reference to exhaust steam heating. P. West, diags Heat & Ven 12:46-8 Mr '15
Exhaust steam turbine practice. C. A. Tupper. il Iron Tr R 55:1031-5+ D 3 '14
Exhaust steam turbines. il Colliery 35:619-20

Five hundred kilowatts from exhaust of hoisting engine. T: Wilson, il diags plans Power 42:143-6 Ag 3'15

42:143-6 Ag 3 '15
Freeing condensed steam from oil. Sci Am 112:325 + Ap 3 '15
Heating value of exhaust steam. D: M. Myers. Eng M 49:712-17 Ag '15
Heating value of exhaust steam. D: M. Myers. Sch Mines Q 36:40-7 N '14
How much is exhaust steam worth? G. D. Crain, jr. Power 40:811 D 8 '14
Miter coils for exhaust steam heating. A. G. Solomon. diag Power 42:506 O 12 '15
Modern practice in heating and ventilation.
A. G. King. diags Dom Eng 72:102-4 Jl 24
'15

Ordinary wastes in the power plant. C: L. Hubbard. plans Eng M 49:809-17 S '15
Possible economies from the use of exhaust steam in a water gas plant. S. A. Reinhard and C. A. Schnerr. il plan Am Gas Light J 102:225-30 Ap 12 '15
Pressure survey study constituting a report on the comparative use of exhaust and live steam for heating. C. C. Wilcox. diag plans Heat & Ven 12:23-32 Ag '15; Abstract. Elec R & W Elec'n 66:1120 Je 12 '15
Problems in power-plant design. (Engineers' study course) C: L. Hubbard. Power 41:66-8 Ja 12 '15
Selling exhaust steam versus operation con-

Selling exhaust steam versus operation con-densing. Elec W 65:1556 Je 12 '15 1250 kw mixed pressure turbo-generator; ab-stract. F. Schulte. Am Soc M E J 37:651-2 N

Use of steam from the receiver of a compound engine. A. Beaurrienne. Am Soc Heat & V E 19:228-43 '13

Utilization of exhaust steam. diags Sci Am S 80:277 O 30 '15

Utilization of waste heat for the generation of electrical energy. H. Hobson, diag Inst E E J 53:844-5 Je 15 '15

Vacuum steam heating, mechanical and the thermostatic valve. A. ( diags Dom Eng 72:310-12 S 11 '15 d systems G. King.

Wait turbo-generator on elevator load in the Lumber exchange building, Chicago. il diags Power 42:717-20 N 23 '15

Vashington avenue power plant, Scranto Penn. W. O. Rogers. Power 41:875 Je 29 '15 Washington Scranton,

What is exhaust steam worth? E. Brown. Power 42:155 Ag 3 '15

What is exhaust steam worth? R. McCarthy. Power 42:242 Ag 17 '15

Exhaust systems. See Dust removal; Waste re-

Exhibitions

Seattle industrial exhibit, il Iron Age 96:194-5 Jl 22 '15

See also San Diego—Panama-California exposition; San Francisco—Panama-Pacific international exposition; also subdivision Exhibitions under names of subjects, e. g. Machinery—Exhibitions

Exits (building)
Inclined walkways replace stairs and elevators in new Victor building at Camden, N. J. il plans Eng Rec 72:656-7 N 27 '15

Expansion (heat)

Temperature coefficient of expansion of pe-troleum residuums. H. Rossbacher. diag J Ind & Eng Chem 7:577-8 Jl '15

Expansion joints. See Concrete construction Expansion joints; Pavements—Expansion Pavements-Expansion joints

Explorers

Light reading for polar explorers, Sci Am 112: 262 Mr 20 '15

Explosions

Cereal dust explosions. D: J. Price. Colliery 35:671-2 Jl '15
Decomposition of ammonia and the chances of explosions. F. L. Fairbanks. Power 42:715-17
N 23 '15

N 23 '15
Explosibility of grain dusts. D: J, Price and H. H. Brown. Sci Am S 78:368 D 5 '14
Explosion in Pasadena septic tank. il Metal Work 84:464 O 8 '15
Explosion leaves grain elevator practically intact. il Eng Rec 72:119-20 Jl 24 '15
Explosion of a small hot water heater in a garage. il Locomotive 30:170-2 Ap '15
Explosion of hot-water tank. H. E. Collins. il diag Power 41:451-2 Mr 30 '15
Explosion of kerosene lamps. Sci Am S 79:92

Explosion of kerosene lamps. Sci Am S 79:92 6 '15

Explosion of picric acid. A. Cooper-Key. Engineer 119:155 F 12 '15
Explosions in air liquefaction plants and their causes; abstract. W. Bramkamp. Am Soc M E J 37:401-3 Jl '15
Explosives and accidents. Engineer 120:299 S

Gas explosions in boiler furnaces. diags Power 41:553-4, 651-3, 719, 785-6 Ap 20, My 11, 25, Je 8 '15

Gas explosions in boilers, R. Trautschold. Power 42:650-2 N 9 '15 Gaseous explosions. D. Clerk. Sci Am S 79:

288 My 1 '15
Preventing cupola explosions. F.
diag Iron Tr R 55:1228+ D 31 '14
Septic tank explosion at Florence,
Maffitt. Eng N 73:410-11 F 25 '15 Osswald, il

See also Boiler explosions; Coal dust; Coal mines and mining—Accidents and explosions; Explosives; Flywheel explosions; Mine explosions; Safety lamps; Sewer explosions

Explosives

Cellulose for explosives. Engineer 120:275-6 S

Chemical engineering in nitrocellulose manufacture. S. L. Stadelman, Met & Chem Eng 13:361-6 Je '15

Coal-tar products used in making explosives. C. G. Storm. U S Bur Mines Tech Pa 89:

16-17 '15
Contributions of the chemist to the explosives industry, C: E. Munroe, J Ind & Eng Chem 7:945 N '15
Dynamite does not shoot down, Colliery 35: 546-7 My '15
Efficiency of explosives. A. Stettbacher, Sci Am S 80:219 O 2 '15
Explosives and accidents. Engineer 118:531-2
D 4 '14
Explosives as an aid to engineering C: Explosives as an aid to engineering C: Explosives as an aid to engineering.

D 4 '14
Explosives as an aid to engineering. C: E. Munroe. Am Soc M E J 37:705-7 D '15
Explosives for driving concrete piles. F. T. James. Eng N 74:558-9 S 16 '15
Explosives from tar. Am Gas Light J 102:279, 282 My 3 '15
Explosives from tar products. V. B. Lewis. Am Gas Light J 102:197 Mr 29 '15
Explosives used in war and metal mining. P. E. Barbour. Eng & Min J 100:507-11 S 25 '15

Freezing point of low freezing explosives.

A. La Motte. Colliery 35:317 Ja '15

Explosives —Continued

High explosives. L. S. Marsh, il W Soc E J 20:152-62 F '15; Same, Sci Am S 80:104-5 Ag 14 '15; Discussion, W Soc E J 20:162-71 F

High explosives vs. dyestuffs. Textile World

48:528-9 F '15 Liquid air as an explosive; abstract. M. Przy-borski. Am Soc M E J 37:341-2 Je '15 Permissible explosives tested prior to March 1, 1915. S. P. Howell. U.S. Bur Mines Tech Pa 100:1-14 '15

Pa 100:1-14 '15
Primer on explosives for metal miners and quarrymen. C: E. Munroe and C. Hall, diags pls U S Bur Mines Bul 80:1-117 '15
Production and distribution of explosives in the United States during the calendar year 1914. A. H. Fay, tables U S Bur Mines Tech Pa 107:1-14 '15
Tolerances in tests of permissible explosives. J Ind & Eng Chem 7:716-17 Ag '15

See also Ammunition; Blasting; Inflammable mixtures; Torpedoes

#### Storage

Safe distance for powder houses. Eng N 74 754 O 14 '15; Same. Eng & Min J 100:842 N 20 '15

#### Transportation

Annual report of Bureau of explosives. Ry Age 58:792 Ap 9 '15 Safe transportation of small-arms ammuni-tion. il Sci Am 112:589-90 Je 12 '15

Explosives, Military

Blowing up barbed wire entanglements: the poles bearing explosives used by the French, Russian and English armies. il Sci Am 111: 468-9 D 5 14

468-9 D 5 '14
European war from an engineer's standpoint.
J. B. C. Kershaw, il Eng M 49:43-50 Ap '15
High explosives in warfare. W. Macnab. Sci
Am S 79:117 F 20 '15
Military explosives; their chemistry, preparation and action. Sci Am S 80:150-1, 166-7 S
4-11 '15

Modern munitions of war. V. Lewes. Engineer 120:69 Jl 16 '15
Munitions of the present war. Ry R 57:373-5

Properties and uses of military explosives. L. Cresap. Iron Age 96:752-3 S 30 '15
Trinitrotoluene in the war. Sci Am S 79:171

Use of cotton for the production of explosives. Sci Am S 80:271 O 23 '15 What happens when gunpowder explodes. Sci Am S 79:246 Ap 17 '15

Export trade

American goods for Australian use, J: P. Bray. Metal Work 83:351 Mr 5 '15
American international corporation organize to promote foreign trade. Elec W 66:1180-1 N 27 '15

American pipe and fittings in South Africa. Iron Age 96:1230-1 N 25 '15 Big financial concern to aid foreign trade. Ry R 57:705 N 27 '15

Big financial concern to aid foreign trade. Ry R 57:705 N 27 '15

Consular recommendations on South American trade. U S Bur For & Dom Com misc ser 20:1-29 '15

Consular service in business getting. Iron Age 96:526-7 S 2 '15

Co-operation in developing foreign trade. W. N. Dickinson. Metal Work 82:734 D 4 '14

Export movement set forward at St. Louis. Iron Age 95:246-51+ Ja 28 '15

Export prossibilities. P. Hough. Textile World 49:233-5 My '15

Export price records. H. A. Russell. Iron Age 96:1114-15 N 11 '15

Export trade and how to get it. G. F. Bagge-Feron. Dom Eng 70:111-13 Ja 23 '15

Export trade and how to get it. G. F. Bagge-Feron. Elec R & W Elec'n 66:86-8, 123-6, 161-4 Ja 9-23 '15

Federal commission hearings bring out weaknesses in export trade. Automobile 32:1046-7 Je 10 '15

ederai nesses in 10 '15

Hirts for American exporters. F: Schreibman. Eng M 49:662-71 Ag '15 How to secure foreign trade. F: Schreibman. Eng M 49:900-5; 50:86-92, 293-300 S-N '15 How to sell to Latin-America. A. Del Mar. il Eng M 50:341-56 D '15

In time of war, prepare for trade. D. Wells. Iron Tr R 57:998-9 N 18 '15
Limitations on association activities in developing export trade. P. T. Cherington. Textile World 49:217-19 My '15
Meeting of the 2d National foreign trade convention. Elec W 65:253-4 Ja 23 '15
Metal-working machinery April exports show \$2,000,000 increase or 150 per cent. Iron Age 95:1346-7 Je 17 '15
Selling railway supplies to European countries. W. S. Hiatt. il Ry Age 59:901-4 N 12 '15
Trade commission gathering views on export combinations. Ry R 57:704-5 N 27 '15
What business asks of trade commission. Iron Age 95:1293-4 Je 10 '15
See also South America—Commerce: United

See also South America—Commerce; United States—Commerce

Express companies

Express companies granted higher rate. Ry Age 59:214-15 Jl 30 '15
Meeting the problems of the express companies, B. D. Caldwell. Ry Age 58:367-9 F 26 '15

Minnesota express rate case. R. H. Tucker. J

Account 19:107-17 F '15
Railway revenue and the parcel post. V. L.
Bradley. Eng M 48:593-6 Ja '15
Statistics of express companies for 1914. Ry
Age 58:1053 My 21 '15

See also Parcel post

Express rates. See Express companies

Extensometers

xtensometers
Effect of the end connections on the distribution of stress in certain tension members.
C. Batho. il diags J Fr Inst 180:129-72 Ag
'15; Abstract (Tests prove lug angles valueless for insuring uniform stress distribution).
Eng Rec 72:512-14, 608 O 23, N 13 '15
Fixing the elastic limit standard. T. D. Lynch.
il Iron Tr R 57:79-81+ J1 8 '15

Extra crew laws. See Railroad law

Brightness-difference sensibility of the eye under various brightness of test-fields and surroundings. P. W. Cobb. J Fr Inst 180: 235-7 Ag '15

surroundings. P. W. Cobb. J Fr Inst 180: 235-7 Ag '15
Colored glasses for eye protection. M. Luckiesh. Iron Tr R 57:437-8 S 2 '15
Effect of ultra-violet rays on the eye. Sci Am 113:323 O 9 '15
Effect on the eye of ultra-violet light. W. E. Burge. il diags Elec W 65:912-14 Ap 10 '15; Abstract. Sci Am S 80:345 N 27 '15
Efficiency of the eye under different conditions of lighting; the effect of varying the distribution factors and intensity. C. E. Ferree and G. Rand. Il Illum Eng Soc 10:407-47 no 6 '15
Eye and illumination, H. E. Mahan. Gen Elec

Eye and illumination. H. E. Mahan. Gen Elec R 18:268-72 Ap '15

Eye and illumination, H. E. Mahan, Gen Elec R 18:268-72 Ap '15
Eye protection for grinders and machinists, H. W. Davie, il Mach 21:570-1 Mr '15
Further experiments on the efficiency of the eye under different conditions of lighting, C. E. Ferree and G. Rand, il plan Illum Eng Soc 10:448-501 no 6 '15
Illumination and the human eye, Elec W 65: 624-5 Mr 6 '15
Minimum visual angle, Sci. Acc. C. 2000.

Minimum visual angle. Sci Am S 80:93 Ag 7

Mode of action of ultra-violet radiation in injuring the refracting media of the eye. W. E. Burge. J Fr Inst 180:477-8 O '15 Proper eye protection. W. B. McKibbin. il Mach 21:296 D '14

Résumé of the physical, physiological and psychic phases of vision. N. M. Black. diags Illum Eng Soc 10:562-86 no 7 '15

Retinal sensibilities related to illuminating engineering. P. G. Nutting. J Fr Inst 180:482-4

Searching earching for a reason for eye fatigue. M. Luckiesh, Elec W 66:576-8 S 11 '15

See also Color blindness; Eyestrain; Goggles; Light; Spectacles

Eyestrain

efficiency of the eye under different conditions of lighting; the effect of varying the distribution factors and intensity. C. E. Ferree and G. Rand, il Illum Eng Soc 10:407-47 no 6'15

Eyestrain-Continued

Ferree test for eye fatigue; with discussion.
J. R. Cravath, Illum Eng Soc 9:1033-59 no 9

'14
Further experiments on the efficiency of the eye under different conditions of lighting. C. E. Ferree and G. Rand, il plan Illum Eng Soc 10:448-501 no 6 '15
Life-study of patients. G; M. Gould. Sci Am S 79:226-7 Ap 10 '15
Light and the human machine. Illum Engr 8:335-8 Ag '15

# F

Factories

Factories

Dry rot in factory timbers. F. J. Hoxie. Eng Rec 71:336-7 Mr 13 '15

Economical design of factory buildings. W. E. King. Assn. Eng Soc J 52:293-307 Je '14; Same cond. Ind Eng 14:289-93 Jl '14; Same cond. Eng & Contr 42:138-41 Ag 5 '14; Same cond. Eng & Contr 42:138-41 Ag 5 '14; Same cond. Eng M 48:91-5 O '14; Same cond. Mach 21:341+ D '14; Discussion (Track layouts for industrial plants). G: H. Herrold. Assn. Eng Soc J 52:307-10 Je '14; Same. Eng N 72:357 Ag 13 '14

Economical system of construction; suggested design for factory or warehouse. H. E. Barr. il diags Iron Age 95:885-7 Ap 22 '15

Efficient planning in mercantile structures: the Kuppenheimer factory building, Chicago, Ill. il plan Brickb 23:291-3 D '14

Factory built at 60 cents per square foot: the Hart & Hutchinson plant at New Britain, Conn. il plan Iron Age 95:231-3 Ja 28 '15

Faucet manufacturing plant, Chicago. il Metal Work \$4:396 S 24 '15

Inclined walkways replace stairs and elevators in new Victor building at Camden, N. J. il plans Eng Rec 72:656-7 N 27 '15

Logic of the one story factory. G. D. Crain, jr. Iron Tr R 57:188+ Jl 15 '15

Making sprocket chain without waste, il Iron Age 95:1105-9 My 20 '15

Manufacture of the Diesel engine: production processes and the plant of the Busch-Sulzer bros., St. Louis. O. J. Abell. il diags plan Iron Age 95:158-91 Ja 21 '15; Same. Metal Work 83:274-6 F 12 '15; Same. Eng & Contr 43:144-5 F 17 '15

Model factory building for small plants. il plan Iron Age 95:188-91 Ja 21 '15; Same. Metal Work 83:274-6 F 12 '15; Same. Eng & Contr 43:144-5 F 17 '15

Reducing the fire hazard in a factory. H. A. Russell. il Iron Age 96:718-81 Ja 21 '15; Same. Metal Work 83:274-6 F 12 '15; Same. Eng & Contr 43:144-5 F 17 '15

Reducing the fire hazard in a factory. H. A. Russell. il Iron Age 96:741-3 S 30 '15

Rehabilitation of existing plants as a factor in production costs. H. V. Coes. il plans Eng M 49:357-71, 560-73 Je-J1 '15

Rehabilitation of existing plants as a factor in production of existing plants as a f

Tide column spacing effects economy in factory floor area. E. W. Stern, diags Eng Rec 71:177 F 6 '15

See also Automobile factories; Cotton mills; Factory laws; Factory management; Iron works; Knitting mills; Loft buildings; Mills and millwork; Steel works; Textile mills; Water supply for factories

# Heating and ventilation

Combined heating and sprinkler system for a factory building; Wheelock, Lovejoy & co., Cambridge, Mass. C: L. Hubbard. il plans Heat & Ven 12:13-17 O '15

Factory building equipped with outside air ducts, il plans Heat & Ven 12:19-25 Ap '15 Factory with down ventilation through columns, il plan Eng N 73:1012-13 My 27 '15 Heating and ventilating a factory building, il plans Metal Work 83:669-71+ My 7 '15 Heating and ventilating factories, diags Iron Age 95:343 F 11 '15 Heating and ventilating industrial plant. I. Heating and ventilating industrial plant.

Age 95:343 F 11 '15

Againg and ventilating industrial plant. J. H.
O'Brien, il Metal Work 83:319-22 F 26 '15

Heating and ventilating system of American
cigar co.'s plant. W. L. Durand. il plans
Power 41:460-2 Ap 6 '15

Heating and ventilating system that conserves the comfort of 15,000 workers at the
Ford plant in Detroit. il Sci Am S 80:280 O30 '15

Measure of comfort in factories; construction and use of the katathermometer. J. A. Seager, il Heat & Ven 12:24-7 S '15 Model factory building for small plants. il plan Iron Age 95:188-91 Ja 21 '15; Same. Metal Work 83:274-6 F 12 '15; Same. Eng & Contr 43:144-5 F 17 '15 Relation of windows and ventilation in factory buildings. Heat & Ven 12:49 Ag '15 Ventilation of industrial plants. C. T. Graham-Rogers and W: T. Doyle. Metal Work 83: 283+ F 19 '15; Same. Dom Eng 71:4-5 Ap 3 '15

Ventilation standards for factories. Iron Age 95:233 Ja 28 '15

# Lighting

Lighting
British government committee reports on factory lighting. Elec R & W Elec'n 67:810-11 O 30 '15
Code for better industrial lighting. C. E. Clewell. il Elec W 66:1135-7 N 20 '15
Efficient lighting for industrial workers. F Schwarze. il Metal Work 83:662-4 My 7 '15
Examples of modern factory lighting by gas. il Illum Engr 8:339-42 Ag '15
Factory lighting. G. H. Stickney. Gen Elec F 18:67-71 Ja '15; Same cond. Eng M 48:912-18 Mr '15; Same cond. Sci Am S 79:363 Je 5 '15

Broadberry, il Illum Engr 8:199-202 My 'If Factory lighting; with discussion. O. R. Hogue and A. O. Dicker, Illum Eng Soc 9:974-89 no 14

9 '14
First report of the departmental committee on the lighting of factories and workshops. Illum Engr 8:365-90, 420-2 S-O '15
Industrial lighting by mercury vapour lamps. il Illum Engr 8:344-5 Ag '15
Light and the human machine. Illum Engr 8:325-8 Ag '15
Light as a factor of efficiency. W. A. D. Evans. il Textile World 48:195-9, 354-7 N-D

Lighting in factories and workshops. Engineer 120:262 S 10 '15 Lighting of factories and workshops, il Am Gas Light J 103:257-8 O 25 '15 Overhead shop lighting, il Illum Engr 8:343

Problem of mill lighting. Textile World 50: 81-5 O '15 Suggested code of lighting for factories,

uggested code of lighting for factories, mills and other work places in the United States. Illum Engr 8:414-19, 451-5 O-N '15 (to be cont)

# Location

ffect of climate on location of manufactur-ing plants. W: M. Booth. Sci Am S 79:219 Ap 3 15

Froblems involved in industrial pioneering. L. L. Anthes. Foundry 43:82-3 F '15 Rehabilitation of existing plants as a factor in production costs. H. V. Coes. ii plans Eng M 49:357-71, 560-73 Je-JI '15

Factory hospitals. See Hospitals, Factory

Factory laws
Existing requirements regarding lighting in factories, schools, etc., in various countries. Illum Engr 8:381-3 S '15
How state laws compel removal of dust. H. C. Estep, il Foundry 43:43-51 F '15; Same. Iron Tr R 56:415-22 F 25 '15
Modern sanitation in factories. J. Graham, il diags Dom Eng 69:393-7 D 26 '14

See also Foundry laws

Factory management
Balancing production with sales. C. W. Thayer.
Mach 21:968 Ag '15
Checking freight charges, P. A. Smith, Iron
Age 95:536 Mr 4 '15
Economies of a manufacturing plant. J: S.
Branne. Assn Eng Soc J 54:53-62 F '15
Eisemann's train-dispatcher system. J. E;
Schipper. il plans Automobile 32:580-5 Ap
1 '15
Factory cleanliness—its meaning, application

Factory cleanliness—its meaning, application and results. J. D. Hackett. Ind Eng 15:54 F

'15 Ford methods and the Ford shops. H. L. Arnold; F. L. Faurote, il Eng M 47:179-203, 331-58, 507-32, 667-92, 857-86; 48:33-60, 338-66, 524-50, 704-21, 859-76; 49:67-87, 184-201, 372-93 My-O, D '14-Je '15 Four-part factory inventory system. H. A. Russell. Iron Age 95:1218-25 Je 3 '15 Handling of regrit work in the factory A. A.

Kussell. Iron Age 95:1218-25 Je 3 '15 Handling of repair work in the factory. A. A. Dowd. Iron Age 95:994-5 My 6 '15 How to organize your night force. H. C. White. Iron Tr R 56:1056-8 My 27 '15; Same. Iron Age 95:1174-6 My 27 '15; Same. Ind Eng 15: 95-7 S '15

How to use statistics in management. F. G. Coburn. Eng M 49:717-23 Ag '15 Increased efficiency. A. A. Dowd. Sibley J 29: 157-63 F '15

157-63 F '15 Industrial fatigue; abstract of report to the British association, Engineer 120:292 S 24 '15 Industrial safety and principles of manage-ment. W. P. Barba. Am Soc M E J 37:692-5 D '15; Same cond. Iron Age 96:1232-4 N 25

'15
Locating an executive in the factory. H. A. Russell. plan Iron Age 95:344-5 F 11 '15
Measurement of efficiency. H. L. Gantt. Iron Tr R 55:1131-3 D 17 '14; Same. Ind Eng 14: 463-5 D '14; Same. Iron Age 94:1320-1 D 3 '14; Same. Automobile 31:1104-5 D 17 '14; Same cond. Ry Age (Mech ed) 89:249-51 My '15; Same cond. Metal Work 83:725-6 My 21 '15; Abstract. Eng M 48:577-80 Ja '15; Abstract; with discussion. Am Soc M E J 37:11-13 Ja '15

More about the human factor. D: M. Myers.

More about the human factor. D: M. Myers. Eng M 49:801-8 S '15 Ordering tools and supplies in the factory. P. W. Blair. Mach 21:745 My '15 Panic economies and emergency problems with especial reference to the present industrial situation. F. A. Waldron. Am Soc M E J 36:413-17 D '14; Same cond. Ind Eng 14: 397-400 O '14; Discussion. Am Soc M E J 36:417-19 D '14 Preventing losses in factory power plants. S. J. H. White, Iron Age 95:777-9, 848-9 Ap 8-15 '15

S. J. H. 8-15 '15

Reduction of power costs in a factory power plant. T. K. Roberts. diags Ind Eng 14:445-50 D '14

50 D 14
Relation between production and costs. H. L. Gantt. Am Soc M E J 37:466-8 Ag '15; Same. Am Gas Light J 103:54-5 Jl 26 '15; Same. Iron Age 96:16-18 Jl 1 '15; Same. Iron Tr R 57:267-8+ Ag 5 '15; Same. Mach 21:1000-2 Ag '15; Discussion. Am Soc M E J 37:468-75 Ag '15; Abstract of discussion. Iron Age 96:24-5 Jl 1 '15

Il 1 '15
Relation of the inspection department to the management. F. B. Corey. Ind Eng 15:17-18
Ja '15; Same. Iron Age 95:566-7 Mr 11 '15
Results of factory standardization. C. B. Auel.
il diags Iron Tr R 57:125-30 Jl 15 '15; Abstracts. Iron Age 94:1280-2 D 3 '14; Ind Eng 14:458-60 D '14; Am Soc M E J 37:13-15; Discussion. 37:15-16 Ja '15
Routing—schedule and despatch. G: D. Babcock. il Ind Eng 14:427-31 N '14
Scientific management for the factory of moderate size. D. T. Farnham. Eng M 50:46-51
O '15
Shop system of the American machine & foun-

O '15
Shop system of the American machine & foundry co. E: K. Hammond. diags Mach 21:446-50 F '15
System in a factory stock department. G. H. Culver. il Eng M 49:174-83 My '15
Value of preliminary sketches and layouts in production work. A. A. Dowd. diags Horseless Age 36:232-4 S 1 '15
Value of specialization in factory. A. A. Dowd. 11 diags Iron 'Tr R 57:259-63 Ag 5 '15

Waste in hiring and discharging employees. M. W. Alexander. Sci Am S 79:102-3 F 13 '15; Same cond. Am Gas Light J 103:43-4 J1 19 '15; Abstract. Iron Age 94:1032-3 O 29 '14; Abstract. Metal Work 82:609-10 N 6 '14; Abstract. Eng M 48:733-6 F '15

See also Cost accounting; Employees; Employment systems; Factory restaurants; Mechanical handling; Purchasing; Records; Routing systems; Scientific management; Stope management; Stores systems; Time study; Welfare work in industry

Factory mutual companies
Insurance methods for payment of large losses.
J. P. Gray. Textile World 49;228-30 My '15

Factory restaurants
Eliminating the dinner bucket, E. W. Pargny, il Iron Tr R 55:1089-91 D 10 '14

Factory sanitation Industrial betterment. F. E. Cardullo. il Mach 22:175-9 N '15

22:173-9 N '15
Modern sanitation in factories. J. Graham. il
diags Dom Eng 69:393-7 D 26 '14
Toilet regulations for industrial establishments: report of committee, Boston Soc
C E J 2:79-89 F '15; Same cond. (Sanitation
in shops and factories) Eng M 49:100-1 Ap

See also Dust removal; Factories—Heating and ventilation; Foundry sanitation; Toilet rooms; Water supply for factories

Factory towns. See Model towns

Factory waste. See Refuse and refuse disposal: Trade waste

Fairport, New York

Bridges

Lift bridge constructed on 4 per cent. grade. C: R. Waters, il Eng N 73:705-6 Ap 15 '15

Fall River, Massachusetts

Fall River bridge. J. W. Rollins. il diags Boston Soc C E J 1:67-81 F '14

Fall River mills will benefit by \$3,000,000 water and sewerage project, diag Eng Rec 72:501-3 O 23 '15 New water-conserved.

ew water-conservation scheme at Fall River, Mass. diag Eng N 74:760-1 O 14 '15

Water supply

Fall River's proposed water supply system, il diag Sci Am 113:353+ O 23 '15 Plan for condensing-water supply for Fall River, H. S. Knowlton, plan Power 42:643-4

River.

Family resemblances. See Heredity

Fancy work

See also Knitting

Fans, Electric

ans, Electric
Electric fans in the winter: installed in the cold-air intakes of furnaces to increase temperature and reduce coal consumption. P. W. Gumaer. plans Elec W 65:229-31 Ja 23 '15; Abstract. Ind Eng 15:79 Ag '15; Abstract. Heat & Ven 12:46-7 S '15
Gyrating fans. il Elec W 66:1110 N 13 '15
New departure in electric-fan construction. il Elec R & W Elec'n 66:313-14 F 13 '15
Running a fan economically. Colliery 35:398 F '15

Westinghouse electric fans for 1915. il Elec R & W Elec'n 66:265-9 F 6 '15

Fans, Exhaust

Exhaust fan ratings and pipe diameters. Metal Work 83:721-2 My 21 '15

Fans, Mechanical

British Portland cement making machinery; application of fans. il diags Engineer 120: 102-5 Jl 30 '15
Fan trouble solved by ball bearings. F. E. Rogers, ir. il diag Textile World 49:569-71

Ag '15
Fans for ventilating work. C. L. Hubbard.
Eng M 48:385-92 D '14; Same. Eng & Contr
43:197-9 Mr 3 '15

New ventilating fan and blower, il Power 40: 919 D 29'14

Fans, Mechanical -Continued

ans, Mechanical—Continued
Notes on fans. A. A. Potter and S. L. Simmering. Power 41:S16 Je 15 '15
Outline specification of ventilating fan, M. B. Smith, Power 42:772 N 30 '15
Performance and selection of centrifugal fans.
F. L. Busey. Heat & Ven 12:31-7 Ap; 32-5
My '15
Problems in power plant, design (Thesis and Selection)

Problems in power-plant design. (Engineers' study course) C: L. Hubbard. Power 40:820-2 I 8 14

Reduction or elimination of noise attending the operation of mechanical ventilating machinery. R. W. Pryor, jr. plans Heat & Ven 11: 26-9 Ag '14; Same. Iron Age 94:210-11 Jl 23' 14; Same. Metal Work 28:275-6 S 4 '14; Same; with discussion. Am Soc Heat & V E 20:320-9

Testing of ventilating fans. T: Bryson. Collery 35:465-7 Ap '15; Abstract. Am Soc M E J 37:124 F '15

J 37:124 F '15 Theory and application of centrifugal fans. C: L. Hubbard. il diags Dom Eng 69:289-91, 357-9; 70:36-7 D 5, 19 '14, Ja 9 '15 Theory and practice in warm-air heating. diags Metal Work 84:451-3 O 8 '15

See also Fans, Electric; Mechanical draft

Far Fast

Winning of the Orient, E; H. Foot, il Am Ind 15:20-2 Ap '15

Faraday society
75th ordinary meeting, May 11. Met & Chem
Eng 13:499-501 Ag '15

Fare registers. See Street railroads-Fare regis-

Fares. See Railroads—Fares; Street railroads—Fares

Fargo, North Dakota

Water supply

New water works ordinance adopted by referendum. Eng & Contr 43:396 My 5 '15 Water-works charges and depreciation at Fargo. Eng N 73:994-5 My 20 '15

Farm buildings

frouping of farm buildings; examples from the work of Alfred Hopkins. J. J. Klaber. il plans Arch Rec 37:340-59 Ap '15 See also Dairy houses; Farmhouses; Poul-

try houses; Stables

Farm motors

See also Electricity on the farm; Tractors

Farm produce

See also Cotton; Forest products

Transportation

Hearings on western freight rate advances. Ry Age 58:617-19, 700-2 Mr 19-26 '15 Relation of farm produce hauling to permanent road improvements. W. A. McLean. Eng & Contr 42:215-17 Ag 26 '14

Farm produce, Marketing of Marketing our food products. Sci Am S 78:390 D 19 '14

Farm tractors. See Tractors

Farmhouses

Model design of Minnesota farm house, il plans Bldg Age 37:38-40 Mr '15 Sewage disposal in rural country districts. B. D. Colby, Metal Work 84:341-3 S 10 '15

ater supply and sewage disposal. Metal Work 84:398 S 24 '15

Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger, diags Dom Eng 72:194-7, 224-6, 254-6, 284-6, 313-15, 338-40 Ag 14-S 18 15

Farms. See Demonstration farms

Fastenings

Fastenings for stone or steel. H. M. Schember, il diags Bldg Age 37:69-70 F '15

Fasting

Hunger strikes an aid to good health. M. D. Pearl. diag Sci Am 112:67 Ja 16 '15

Fat extraction apparatus

New apparatus for fat extraction. I. Selecter.
il J Ind & Eng Chem 7:871-2 O '15

Simple fat extraction tube. C. A. Butt. diag
J Ind & Eng Chem 7:130 F '15

How excitement relieves fatigue. Jakobi. Sci Am 113:253 S 18 '15 Industrial fatigue; abstract of report to the British association. Engineer 120:292 S 24 '15

Fatigue in metals

atigue in metals under repeated stresses; some new facts, and a new method of testing. diags Locomotive 30:120-42 Ja '15 Fatigue and disease of metals. P. Kreuzpointer. Iron Age 95:950-1 Ap 29 '15 Fatigue of copper alloys. E. Jonson. Metal Ind n s 13:283-4 Jl '15; Same. Eng Rec 72:22-3 Jl 3 '15; Same, with discussion. Foundry 43: 211-19 Ag '15

311-12 Ag '15

Fats. See Oils and fats

Fatty acids. See Acids, Fatty

Faucet boss problem solved by triangulation. diags Metal Work 84:245-6 Ag 20 '15

Question of increase; how small is the chance that an individual will grow up. il Sci Am 113:292-3 O 2 '15

Federal reserve act

Aspects of the financial problem of the railways; effect which the Federal reserve act will have on needs of railways for new capital. H. P. Willis. Ry Age 58:999-1002 My 14

Bank loans under the new conditions: borrowers' certified statements as a basis for national currency. F. G. Colley. J Account 18: 418-26 D '14

418-26 D '14
Federal reserve banks and the reserve agent.
F. B. Snyder. J Account 20:28-33 Jl '15
New finance for steel and iron: how the new federal reserve system can be utilized to free business from the handicap of a rigid credit system through the employment of acceptances in liquidation of debt. I: F. Marcosson. il Iron Tr R 56:9-15 Ja 7 '15

Federal trade commission. See United States-Federal trade commission

Federation of trade press associations
10th annual convention, Philadelphia, S
7-9. Elec R & W Elec'n 67:537 S 18 '15 Sept.

Feed water

eed water
Boiler water and its troubles. C. M. Young. il
Colliery 35:527-8+ My '15
Centrifugal boiler-feed pumps, J. E. Kamps,
Power 42:693-4 N 16 '15
Centrifugal pumps for boiler-feed service,
E: S. Adams. Power 40:934-5 D 29 '14
Communications from the chemical laboratory
of the Bavarian association for boiler inspection; abstract, Am Soc M E J 37:234-5 Ap
'15

Control for boiler-feed pumps and piping connections. plan Elec W 66:918-19 O 23 '15 Farnsworth tilting traps. diags Power 41:90 Ja

19 '15
Liquid weigher improved. J. W. Loef, diags
Power 41:687-8 My 18 '15
Measuring boiler feed water, diag Elec Ry J
46:284 Ag 14 '15
Return traps for feeding boilers. K. M. Gilbert, diags Power 41:467-8 Ap 6 '15
Saving in the pump room. W: E. Dixon, diag
Power 41:31-2 F 2 '15
Scientific boiler feeding. E. W. Nick. Power
41:33-6 Ja 5 '15
Simple feed-water recorder, il Elec Ry J

Simple feed-water recorder, il Elec Ry J line. A. A.

Mood, diags Power 42:560 O 19 '15

See also Boilers; Feed water heaters; Feed water purification; Feed water regulators; Injectors; Pumps; Pumps, Centrifugal

Testing

Economy of coal and boiler corrosion. G. J. Meyers. Int Marine Eng 20:176 Ap '15

Feed water heaters

Direct-contact feed-water heater, il Elec W 66:375-6 Ag 14 '15

Feed water heater used on geared locomotives. H. S. Johnson, diags Ry Age (Mech ed) 89: 226 My '15

Feed-water heaters in tandem, il Power 42: 682 N 16 '15

Feed water heaters—Continued
Heat transmission and tube length in marine feed-water heaters; abstract. L. Loeb. Am Soc M E J 37:483-7 Ag '15
Home-made feed-water heater—ways to prevent oily water being drawn by feed pumps. diags Elec W 66:1203-4 N 27 '15
Open feed-water heater. F. F. Jorgensen. diags Power 41:441 Mr 30 '15
Putting gasket in heater. A. G. Solomon. diag Power 40:928-9 D 29 '14
Weir feed water heater for locomotive boilers. diags Ry R 57:216 Ag 14 '15

Feed water heating

Teed water heating
Barometric condenser used as a water heater.
K. M. Gilbert, plan Power 42:230 Ag 17 '15
Basis for rational design of heat transfer apparatus. E. E. Wilson. Am Soc M E J 37:546-9; Discussion. 37:549-51 S '15
Double-tank method of storing hot water. plan Elec W 66:24 Jl 3 '15
Economy of heating feed water. C. E. Anderson. Power 41:544-5 Ap 20 '15
Locomotive feed water heating: discussion.
H. H. Vaughan; F. F. Gaines. Ry Age 58: 270-1 F 12 '15; Same. Ry Age (Mech ed) 89: 12 Ja '15
Ordinary wastes in the power plant. C: L. Hubbard, plans Eng M 49:809-17 S '15
Saving of fuel on locomotives by the use of feedwater preheating; abstract. Strahl. diags Am Soc M E J 37:606-7 O '15
Waste hot water heats feed-water. F. B. Hays, diags Power 41:55-6 Ja 12 '15
Will Quizz, jr. Power 41:707-8 My 25 '15
See also Feed water heaters

See also Feed water heaters

Feed water pumps. See Pumps, Centrifugal

Feed water purification

Bayer feed-water purifier, il diags Power 41:

400-1 Mr 23 '15

Boiler water and its treatment. C. M. Young, il Colliery 35:600-4 Je '15

Distilled feed water. C. F. Hirshfeld. Eng M. 49:724-30 Ag '15

Frair condensed steam from oil Sci Am.

49:724-30 Ag '15
Freeing condensed steam from oil. Sci Am
112:325+ Ap 3 '15
Increased temperature saves two-thirds of
the water-softening chemicals, diag Elec W
65:480-1 F 20 '15
Inexpensive method of treating boiler feed
water. T. R. Crumley, diag Elec Ry J 46:
152-3 Jl 24 '15
Method of softening and purifying feed water.

152-3 Jl 24 '15
Method of softening and purifying feed water used by a Brooklyn company, diags Elec W 66:413-14 Ag 21 '15
Purification of boiler feed water. E. Brown, diag Met & Chem Eng 13:156-60 Mr '15
Removing oil from feed water, il Eng M 50: sup1 O '15

Softening plant converts hard, impure river water into boiler feed supply, il Eng Rec 72:622-4 N 20 '15

Treatment of water for locomotive use. W. A. Pownall. Am Water Works Assn J 2:434-41 Je '15; Same. Ry R 56:470-2 Ap 3 '15

Twin grease extractor for feed water, il Iron Age 95:244 Ja 28 '15

Water softener in feed-water treatment. H. R. Dorman, il Power 42:246-8 Ag 17 '15
Water softening by electrochemical methods. C. P. Landreth. Elec W 64:1257-8 D 26 '14

Water treatment. L. F. Wilson. Ry R 57:9-10 Jl 3 '15

Feed water regulators Automatic control of feed water, diags Elec W 66:863-4 O 16 '15

Eckel hydrostat feed-water regulator. il Power 41:466 Ap 6 '15

Foster automatic feed-water regulator, diags Power 41:512 Ap 13 '15

McDonough automatic feed water regulator, il diag Heat & Ven 12:54-5 Ja '15; Iron Age 95:185 Ja 21 '15; Power 41:87 Ja 19 '15

Feed water strainer

Power operated multi-basket strainer, il Iron Age 96:1055-6 N 4 '15; Elec W 66:1108 N 13

Feeding and feeding stuffs
Alcohol and fodder from wood. Sci Am 113:361
O 23 '15

Determination of the total fatty acids and other ether-soluble constitutents of feed-stuffs. J. B. Rather. J Ind & Eng Chem 7: 218-20 Mr '15
Ether-soluble matter in the nitrogen-free extract of feed-stuffs. J. B. Rather. J Ind & Eng Chem 7:613-15 Jl '15
Feeding mine animals Fig. & Min. I 100-224 M. Feeding mine animals. Fig. & Min. I 100-224 M.

Feeding mine animals. Eng & Min J 100:884 N

27 '15 Inorganic fodder, Sci Am 113;8 Jl 3 '15 Quantitative determination of the amino acids of feeding-stuffs by the Van Siyke method, H. S. Grindley, W. E. Joseph and M. E. Slater. Am Chem Soc J 37;1778-81 Jl '15

See also Cottonseed meal; Ensilage; Forage plants

Fehling solution

Volumetric Fehling method using a new indi-cator. A. M. Breckler. J Ind & Eng Chem 7: 37-8 Ja '15

Feldspar

Feldspar as a possible source of American pot-ash. A. S. Cushman and G. W. Coggeshall. J Ind & Eng Chem 7:145-51 F '15; Same. Met & Chem Eng 13:99-104 F '15

Fellowships. See Scholarships and fellowships

Fence posts

Cost

Determination of annual charge for ties, poles and fence posts. W. F. Goltra. Ry Age 58: 1087 My 21 '15

Fence posts, Concrete
B. R. &. P. concrete sign and post plant, diags
Ry Age 58:1434-5 Je 18 '15
Concrete fence post factory of the C. B. & Q.
R. R. co., Havelock, Neb. W. W. Eldridge, il
Concrete Cem 6:99-101 F '15
Concrete fence posts for Lackawanna railway
lines, il Concrete Cem 6:220 Ap '15

Concrete posts and poles; report to the American railway bridge and building association. G: E. Boyd. Ry R 56:360-2 Mr 13 '15

Design and cost of concrete posts used along Catskill aqueduct, diags Eng & Contr 43; 287-8 Mr 31 '15
Practical suggestions given for building wire fences and concrete posts. R. N. Wheeler. Eng Rec 72:361-2 S 18 '15

Fences

Design and cost of two types of concrete and metal fence, F. D. Holbrook, il Eng & Contr 42:489 N 18 '14 Details of picket and board fences and grape arbor, J: Wavrek, jr. diags Bldg Age 37:62

Practical suggestions given for building wire fences and concrete posts. R. N. Wheeler, Eng Rec 72:361-2 S 18 '15

See also Fence posts; Railroads-Fences

#### Cost

Cost of building a rod of fence in North Da-kota. Eng & Contr 43:554 Je 23 '15 Cost of fence wire, wood and steel posts. Eng N 74:362 Ag 19 '15 Costs of three types of board fences. il Eng & Contr 43:446 My 19 '15

Fences, Concrete

ences, Concrete
4½ miles of concrete fence flank transit route
on Sea beach line improvement in Brooklyn.
il Eng Rec 72:68 Jl 17 '15
Unique concrete fence as constructed in Porto
Rico. il plan Concrete Cem 7:56 Ag '15

Fenders. See Motor trucks-Fenders

Fermentation

See also Bacteriology; Brewing; Enzymes

Ferric hydroxide

Effect of ammonium chloride upon ferric and aluminum hydroxides during ignition. H. W. Daudt. J Ind & Eng Chem 7:847-8 O '15

Ferrochrome

Manufacture of ferro-alloys in the electric furnace. R. M. Keeney. U.S. Bur Mines Bul 77:127-41 '14; Excerpts. Iron Tr R 56:972-5 My 13 '15

Ferroilmenite

Ferro-ilmenite arc on alternating-current cir-cuits. I. Ladoff. Elec R & W Elec'n 66:871-2 My 8 '15

Ferromanganese

Electric furnace and the melting of alloys. R. S. Wile. Iron Age 95:1068-9 My 13 '15 Extraordinary year in ferro. Iron Tr R 56:95-6

Manufacture Janufacture of ferro alloys in the electric furnace, R. M. Keeney, U.S. Barr Mines Bul 77:111-6 [11; Same, Iron Age 95:539-40 Mr 4 [15; Same, Iron T.R 56:765-6 Ap 15 [15]

Ferrophosphorus

l'hosphate rock as furnace flux. J. A. Barr. il Iron Tr R 56:183-5 Ja 21 '15

Ferrosilicon

Manufacture of ferro-alloys in the electric furnace, R. M. Keeney, diags U S Bur Mines End (7):151-17 [11], Same, from Tr R 56:862-7 Ap 20-15.

Ferrotungsten

Manufacture of ferro-alloys in the electric furnace, R. M. Keeney, U S Bur Mines Bul 77:177 81 [11] Excerpts, Iron Tr R 56:767 |-Ap 15 [15]

Ferrous ferricyanide

Rhythmical precipitation of ferrous ferricya-nide and ferrous hydroxide in jelly. H: J. M. Creighton. il Am Chem Soc J 36:2357-60 N

Ferrous hydroxide Rhythmical precipitation of ferrous ferricya-nide and ferrous hydroxide in Jelly, H. J. M. Creighton, il Am Chem Soc J. 36:2357-60 N

Ferrous sulphate

orious supriate
Oxidation and reduction without the addition
of acid; the reaction between ferrous sulfate
and polassium dichromate, M. Neidle and
J. C. Witt, Am Chem Soc J 37:2360-8 O '15

Ferrovanadium

Determination of manganese in ferrovanadium. W: W. Clark, Met & Chem Eng 13:155-6 Mr

Ferryboats
Should ferry service be free? H. M. Chittenden, Eng N 74:264 Ag 5 '15
Southern Pacific ferry steamer Alameda, E: W. Olin, il plans Int Marine Eng 20:194-8 My '15

See also Car ferries

Fertility. See Fecundity

Fertilizers and manures Agricultural fertilizers, Sci Am S 79:130 F 27

Agricultural lime, Sci Am S 80:112 Ag 14 '15 Availability of organic nitrogen, J. E. Brecken-ridge, il J Ind & Eng Chem 7:671-3 Ag '15 Bread from stones, C. G. Hopkins, Sci Am S (9:223 Ap 3 '15)

Can sewing sludge be made valuable as a fertilizer? Eng N 73:593 Mr 25 '15 Chemistry of base goods fertilizer. E. C. Lathrop. J Ind & Eng Chem 7:228-33 Mr '15 Composition of certain fish fertilizers from the Pacific const and the fertilizer value of degreened h.h scrap. J: R. Lindemuth. if J Ind & Eng Chem 7:615-19 Jl '15 Contributions of the chemist to the fertilizer industry. H. W. Wallace, J Ind & Eng Chem 7:281 Ap '15 Cost accounting for fertilizer manufacturers.

Cost accounting for fertilizer manufacturers. F. C. Belser. J Account 19:165-81 Mr '15 Discovery of radium in coal. Sci Am 112:423 My 1 '15

Discovery of radium in coal. Sci Am 112:423 My 1 '15 Pertilizer from municipal waste. J. W. Turrentine. Munic J 39:739-40 N 11 '15 German agriculture in war time. Sci Am 112: 216 Mr 6 '15 Germany's artificial fertilizers. J Ind & Eng Chem 7:74 Ja '15 Municipal fertilizer plant at Los Angeles, Calif. B. A. Heinly. Eng N 73:1063-4 Je 3 '15 Practical fertilizer for wartime in Germany. Sci Am S 79:99 F 13 '15 Radio-active fertilizers. Sci Am S 79:53 Ja 23 '15

Radium as a fertilizer. Sci Am 112:396 My 1

Report of committee of American chemical society on fertilizer legislation. J Ind & Eng Chem 7:145 My '15
War and our chemical industries: agricultural industries. W. H. Bowker. J Ind & Eng Chem 7:59-61 Ja '15

World trade in fertilizers, J Ind & Eng Chem 7:716 Ag '15

See also Ammonia; Cyanamid; Gypsum; Phosphates

Fessenden oscillator

Pessenden oscillator to detect submarines, C. Moffett, Elec R & W Elec'n 66:738 Ap 17 '15 Principles of Prof. Fessenden's oscillator, il Sci Am S 80:168, 170 S 11 '15

Official method for determining crude fiber as applied to cottonseed meal. C. K. Francis. il J lnd & Eng Chem 7:676-80 Ag '15 Paper-mill to pressroom; future fiber possi-bilities. W: B. Wheelwright. Inland Ptr 54: 791-2 Mr '15

See also Textile fibers; Vulcanized fiber

Fibers, Textile. See Textile fibers

Fibrox

heat-insulating material. Eng N 73:878-ly 6 '15 New

9 My 6 '15
Preparation and properties of fibrox; abstracts.
E. W. Weintraub. Met & Chem Eng 13:315
My '15; Eng M 49:415 Je '15
My '15; Eng M 49:415 Je '15

Field coils. See Electric motors-Testing

Field museum of natural history, Chicago Methods and plant used in constructing the foundations for the Field museum of natural history. il plans Eng & Contr 44:402-5 N 24

Structural features, diags plan Eng & Contr 44:226-7 S 22 '15

Field post. See Postal service, Military

Filene cooperative association

Industrial betterment, F. E. Cardullo, Mach 22:195-7 N '15

22:199-7 N 15

Files and filing (documents)

Card records of Los Angeles track work, G. E.

Campbell, Elec Ry J 46:407-8 S 4 '15

Efficient and inexpensive filing system, G. W.

Smith, Concrete Cem 7:35-6 Jl '15

Filing and indexing of office computations,
F. H. Jones, Eng Rec 72:128-9 Jl 31 '15

Filing engineering clippings, H: A. Burr, Eng
Rec 72:520 O 23 '15

Highway superintendent of Cook county, Illi-

Rec 72:520 O 23 '15

Highway superintendent of Cook county, Illinois, simplifies filing system, map Eng Rec 72:473-4 O 16 '15

Indexing and filing technical literature, A. R. Kenner, Eng & Min J 99:851-6 My 15 '15

Indexing car equipment data, H. S. Cooper, Elec Ry J 46:1040-1 N 20 '15

Indexing car equipment data, N. Litchfield, Elec Ry J 46:677-8 O 2 '15

Labeling and tiling plans used by the New York highway commission. Eng & Contr 42: 324-5 S 30 '14

New system of filing building plans saves

324-5 S 30 '14

New system of filing building plans saves time. Eng Rec 72:596 N 13 '15

Observations on filing correspondence. C. T. Andrews. Ry Age 59:205 JI 30 '15

Railway-valuation office index and file system. H. J. Saunders. Eng N 74:894-6 N 4 '15

Files and rasps

Progress in machine shop methods, E. R. Norris, Iron Tr R 57:749 O 11 '15; Excerpt (Resharpening of files) Iron Age 96:1175 N

Truing files with acid. J. P. Downs. Mach 21: 954 Ag '15

Filing machines
Tilting table bench filing machine, il diag
Iron Age 96:1223 N 25 '15

Filling and dredging for a Jersey City freight terminal, il diag map Eng N 72:1216-18 D 17

Filters and filtration

Air bound filters. J. M. Caird. Am Water Works Assn J 2:103-6 Mr '15
Air-bound filters. R. S. Weston; J. W. Ellms. Eng Rec 72:458 O 9 '15
Air-bound filters the chief difficulty in operating Wilmington's water purification plant. E. M. Hoopes, jr. il plans Eng Rec 72:282-4 S 4 '15

Alliance water filters. T: Fleming, jr. il plan Eng N 73:812-14 Ap 29 '15 Another milestone in filtration. Eng Rec 71: 575 My 8 '15

Filters and filtration -Continued

Baltimore filters abound in useful hints on concrete construction and design, J. W. Armstrong, il plans Eng Rec 71:583-6 My 8

Baltimore water filtration plant. il plan diags Munic J 38:537-41 Ap 22 '15 Blackburn-Smith twin filter. il Int Marine Eng

Blackburn-Smith twin filter, it int Marine Eng 20:91 F '15
Brass screen between sand and gravel eliminated in Cincinnati filter reconstruction. J. W. Ellms. il Eng Rec 71:581-2 My 8 '15
Court forbids river pollution by filter washwater. Eng Rec 72:160-1 Ag 7 '15
Depth of filtering material and trickling filter efficiency. H. W. Clark. Boston Soc C E J 2:57-61 F '15
Depth of trickling filters; arguments for and against making them more than seven feet deep. H. P. Eddy. H. W. Clark, and G: W. Fuller. Munic J 38:345-7 Mr 18 '15
Design features and cost of operating water filters of pressure type at New Canaan, Conn. diags Eng & Contr 42:132-3 Ag 5 '14
Design of an anti-freezing water filter. W: M. Kinney. diag Concrete Cem 6:38-9 Ja '15
Design of rapid sand water filtration plants.
G: W. Fuller. diags Eng & Contr 42:225-9 S
2 '14 property of rapid sand filters in Objection.

G: W. Fuller. diags Eng & Contr 42:225-9 S 2 '14

Development of rapid sand filters in Ohio. P. Burgess. Eng & Contr 44:337-9 O 27 '15

Economic depth of trickling filters. H. P. Eddy. Boston Soc C & J 2:49-56 F '15; Discussion. G: W. Fuller; H. P. Eddy. 2:63-78, 191-8 F, My '15

Economic size of sand filter beds. C. H. R. Fuller. Eng & Contr 42:179 Ag 19 '14

Economy effected in the use of river sand as a filter medium at Moline, Ill. Eng & Contr 43:236-7 Mr 17 '15

Economy of deep sewage filters explained on basis of "held" water and hydraulics. H. W. Clark. Eng Rec 72:477-8 O 16 '15

Field of the slow sand filter—comparative capacity cost data. R. S. Weston. Eng & Contr 42:313 S 30 '14

Filters balk at operating methods of city fathers. Eng Rec 71:590 Ap 17 '15

Filtration of water; present practice as to the general component parts of rapid filter plants in Illinois. E: Bartow and P. Hansen. plan Munic J 38:99-101 Ja 28 '15

Limitations of water filters. G: W. Fuller. Munic Eng 47:458-9 D '14

Lowell filtration plant for removing iron and manuscanese from water. W. B. Conant. il plan Munic J 39:613-15 O 21 '15

Marysville, Kan., filters handle excessively turbid water. C. C. Young. Eng Rec 72:290-1 New Blackburn-Smith twin feed-water filter.

turbid water, C. C. Young, Eng Rec 12:220-1 S 1 '15

New Blackburn-Smith twin feed-water filter, il Power 41:270 F 23 '15

New filtration plant at Quincy, Illinois, W. R. Gelston, il diag Am Water Works Assn. J. 21:46-52 Je '15; Same, Munic Eng 48:297-My '15; Excerpts, Eng N 73:626-7 Ap 1 '15; Excerpts, Eng Rec 71:424 Ap 3 '15; Discussion, Am Water Works Assn. J 2:452-4 Je '15

New filtration works for Oldham, il diag Engineer 120:105-6, 112 Jl 30 '15

New mechanical filter, il diags Engineer 119: 237-8 Mr 5 '15

New sedimentation basin will halve costs of sand cleaning at Philadelphia filters, F. D. West, diags Eng Rec 71:591-3 My 8 '15

Opening of St. Louis filtration plant, il Eng N 73:1002 My 20 '15

Overhaul Bubbly creek filters, Chicago, after seven years, Eng Rec 72:377 S 25 '15

Philadelphia water-filter operations in 1914.

operations in 1914.

Philadelphia water-filter o Eng N 73:576-7 Mr 25 '15 re water for the army; various forms of ield-service filters. il Sci Am S 80:89 Ag 7

Purifying water by filtration. G. H. White. Metal Work 84:524 O 22 '15

Rapid filter plant at Evanston, Ill. L. Pearse, il plans Am Water Works Assn J 2:160-79 Mr '15

Reasonable requirements in water filter performance. Eng & Contr 42:249-50 S 9 '14

Reconstruction of the beds of the Cincinnati water-filtration plant. Eng N 72:1249 D 24 '14 Results of task work without bonus in clean-ing filter sand at Philadelphia. S. E. Thomp-son. Eng Rec 70:608-9 D 5 '11; Same. Eng ing filter sand at Philadelphia. S. E. Thompson. Eng Rec 70:108-9 [1-5-11]; Same. Eng & Contr 42:579-81 D 23 '14; Same cond., with discussion. Am Soc M E J 37:102-4 F '15; Same cond. (Efficiency study of filter cleaning) Munic J 38:253-4 F 25 '15 River sand as a filter medium. L. A. Fritze. Am Water Works Assn J 2:390-2 Je '15 Roughing filtration plant. plans Engineer 119: 536 My 28 '15

St. Louis will operate world's largest mechani-

cal filters next week; views. Eng Rec 71:578-9 My 8 '15
Seven years' successful operation of double sand filtration plant at South Norwalk, Conn., in removal of objectional tastes and odors. H. W. Clark. Eng & Contr 44:262-3

Conn., in removal of objectional tastes and odors. H. W. Clark. Eng & Contr 44:262-3 O 6 '15 Small mechanical-filter plant, Franklin Furnace, N. J. R. H. Eurich. diags plan Eng N 74:776-9 O 21 '15 Small slow sand water-filter plant for the estate of J. P. Morgan. J: H. Gregory. il diags Eng N 72:1110-11 D 3 '14 Smith system of natural slow sand filtration. L. E. Smith. Eng & Contr 42:247-9 S 9 '14 Standard apparatus and procedure recommended for sand analysis. P. Burgess. Eng Rec 71:644; Discussion. A. Hazen. 71:644-6 My 22 '15 Wash water salvage at Champaign and Ur-

Wash water salvage at Champaign and Urbana, H. E. Babbitt. Am Water Works Assn J 2:393-6 Je '15

J 2:393-6 Je '15
Water filtration hold-up at Ottawa, Ont. Eng
N 72:1167 D 10 '14
Water supply at Wilmington, Delaware. E. M.
Hoopes, jr. and J. M. Caird, il Am Water
Works Assn J 1:111-34 Mr '14; Same cond.
Eng & Contr 42:210-12 Ag 26 '14
World's largest rapid sand filter, St. Louis.
il Sci Am 113:441 N 20 '15

See also Air filters; Oil filters; Sewage disposal—Filtration; Water purification;

Controllers

Automatic control of new filters at Baltimore, J. W. Armstrong. Eng & Contr 44:359 N 3

St. Louis engineers test filter controllers. diag Eng Rec 72:284-5 S 4 '15 Test of filter-rate controllers. E: E. Wall and G. G. Black, plans Eng N 73:880-1 My 6 '15

## Patents

Minneapolis filter patent-case decision. Eng N 74:523 S 9 '15 Minneapolis loses filter infringement suit. Eng Rec 72:191 Ag 14 '15 Niagara Falls water filter suit. Munic J 39: 224 Ag 12 '15

## Testing

Strength tests on strainer plates for Balti-more water filters, diag Eng & Contr 43:103 F 3 '15

Water filter of new type, tested at Toronto, employs drifting sand principle; abstracts. G: G: Nasouth and F: Adams, diag Eng Rec 71:464-5 Ap 10 '15; Engineer 119:355-6 Ap 9 '15; Eng & Contr 43:351-2 Ap 21 '15; Eng N 73:680-1 Ap 8 '15; Eng M 49:438-9 Je

Filters and filtration (metallurgy)
Filtration of slime. L. D. Mills. Met & Chem
Eng 13:724 O 15 '15
New continuous filter. il diags Met & Chem
Eng 13:125-7 F '15
Raising drum-filter vacuum. H. G. Thomson.
diags Eng & Min J 100:724 O 30 '15
Robacher filter. il diag Eng & Min J 99:740-1
Ap 24 '15
Filters and filtration (technical chemistry)

Filters and filtration (technical chemistry)
Efficiency of various methods for the filtration
of sugar solutions. A. E. Roberts. diags J
Ind & Eng Chem 6:386-9 D '14
Official method for determining crude fiber as
applied to cottonseed meal. C. K. Francis.
il J Ind & Eng Chem 7:676-80 Ag '15

Filtros Robacher filter, il diag Eng & Min J 99:740-1 Ap 24 '15 Ap 24

Finance

South America

Financial developments in South American countries. W: H. Lough, U S Bur For & Dom Com 103:1-42 '15

Financial statements Financial statemen Financial statements as a basis of credit, J. E: Masters, J Account 19:334-43 My '15 Standardization of financial statements, F. Oakey, J Account 20:179-85 S '15

Fine arts. See Art

Finger prints

See also Identification

Finlay, Charles John, 1833-1915 Sketch, Sci Am 113:210 S 4 '1

Effect of steaming process of creosoting on strength of Oregon fir piling; abstracts. H. B. Macfarland. Eng Rec 70:487-8 O 31 '14; Eng & Contr 42:481-3 N 18 '14; Summary. Eng N 72:863 O 29 '14

See also Douglas fir

Fire. See Combustion; Fires; Fuel; Heating

Fire alarms

Alternating-current fire-alarm apparatus, il diag Elec W 66:1107 N 13 '15

Fire alarm attachment for recording pressure gauge. W. E. Haseltine, il diag Am Water Works Assn J 1:551-3 S '14; Same, Eng & Contr 42:453-4 N 11 '14

Fire alarm system for Chicago, il diags Munic Eng 48:229-31 Mr '15

Fire-alarm system of New York city. Elec R & W Elec'n 65:1132 D 12 '14

Interior fire-alarm system, il diag Elec W 65: 1005 Ap 17 '15

New fire-alarm system for New York city. Elec R & W Elec'n 67:109 JI 17 '15

San Francisco's new fire alarm station. J. M. Barry, il Munic J 39:837-40 D 2 '15

Signal box records, P. I. Patton, Munic J 39: 397-8 S 9 '15

Thermopile fire detector, il Elec W 65:1479 '75

Thermopile fire detector. il Elec W 65:1478 Je

Where electricity saves the seconds, Sci Am 113:15 Jl 3 '15

Fire apparatus

Amount of apparatus; average number of each kind per hundred thousand population in cities larger than and smaller than fifty thousand. Munic J 39:313-15 Ag 26 '15 Federal fire apparatus. il Munic J 39:328 Ag 26

'15
Fire department statistics; figures received directly from the chiefs of nearly eight hundred fire departments; tabulation. Munic J 39:287-313, 583 Ag 26, O 14 '15
Fire-fighting car at Duluth. il Elec Ry J 45; 472-3 Mr 6 '15; Sci Am 112:479 My 22 '15
Horse-drawn fire apparatus; tabulation. Munic J 39:288-94, 581 Ag 26, O 14 '15
Installation and care of fire-protection apparatus. J. O. Benefiel. plan Power 41:19 Ja 5 '15

ortable searchlights for fire departments. L. C. Porter and P. S. Bailey, il Gen Elec R 18:1144-5 D '15 Portable

Where the smoke helmet would be invaluable: a lesson from the New York subway fire. il Sci Am 112:65 Ja 16 '15

See also Fire engines; Hose; Hose couplings; Smoke helmets

Fire apparatus, Motor Care of rubber tires on fire apparatus. A. H. `Leavitt. Munic J 39:473-4 S 23 '15

Cost of auto apparatus at Schenectady, N. Y. G. M. Chase. Munic J 38:314 Mr 11 '15

Cost of fire apparatus in Douglas, Arizona. Munic J 38:470 Ap 8 '15

Electrically propelled fire apparatus. A. J. Marshall. il Elec R & W Elec'n 67:264+ Ag

Ford first aid chemical apparatus, il Horseless Age 35:542 Ap 21 '15

Motor fire apparatus. J Age 35:802 Je 16 '15 Motor-propelled fire J. A. Anglada. Horseless

otor-propelled fire apparatus; tabulation. Munic J 39:295-301 Ag 26 '15

New developments and recent installations announced since the last annual convention of the International association of fire engineers. il Munic Eng 49:107-13 S '15
Operating conditions of motor fire trucks, A. L. Clough. Horseless Age 35:244 F 17 '15
Packard fire truck with 3-ton chassis, for Parnassus, Pa. il Munic J 39:517 S 30 '15

Parnassus, Pa. il Munic J 39:517 S 30 '15
Recent developments in fire-fighting apparatus—comparative statements of costs of
operation, il Munic Eng 49:185-7 N '15
Statistics of motor fire apparatus; tabulation,
Munic Eng 49:sup59-74+, sup60+ S-O '15
Storage-battery-drive tractor, G: Boughner,
Munic Eng 49:150 O '15

See also Fire engines, Motor

Fire boats

Fire brick

Motor fire float Delta II, il Int Marine Eng 20:492-3 N '15 Tacoma's fire boat, J. Bashford, il Munic J 39:582 O 14 '15

British Portland cement making machinery, Engineer 120:81-2 Jl 23 '15 Characteristics of firebrick for boiler fur-naces, E. H. Tenney, diags Elec W 66:1086-7 N 13 '15

Deterioration of fireclay goods in ovens and retorts. T: Holgate. Am Gas Light J 103:113-18 Ag 23 '15

18 Ag 23 '15
Examination of fire-bricks, W. H. Patterson,
Met & Chem Eng 13:127-9 F '15
Fire brick, C: S. Reed; J. E. Johnson, jr. Met
& Chem Eng 12:740 D '14
Firebrick for boiler furnaces, A. D. Williams,
Power 41:297-8 Mr 2 '15; Same cond. Ind
Eng 15:107-8 S '15

Eng 15:107-8 S '15
Firebrick for boiler settings. W: A. Heisel. Power 41:883-7 Je 29 '15
Manufacture and tests of silica brick for the byproduct coke oven. K. Seaver. il Am Inst Min E Bul 105:1913-27 S '15; Same. Met & Chem Eng 13:861-6 N 15 '15; Abstract. Am Soc M E J 37:610 O '15
New type of brick for hot-blast stoves. diags Iron Age 96:312-13 Ag 5 '15
Selecting refractories for the foundry: abstracts. W. H. Kelley. Iron Age 94:942-3 O 22 '14; Ind Eng 14:469-71 D '14
Selling refractory brick by the ton. Eng & Min J 99:196 Ja 23 '15

Fire departments Chicago fire department, Munic J 39:840-1 D 2

Cincinnati's fire department. il Munic J 39: 283-7 Ag 26 '15

Fire department additions in 1915; tabulation. Munic Eng 48:270-1 Ap '15

Fire department statistics; figures received directly from the chiefs of nearly eight hundred fire departments; tabulation. Munic J 39:287-313 Ag 26 '15

Richmond, Va., fire department. Munic J 38: 476 Ap 8 '15

Springfield, Mass., fire drill school. il Munic J 38:470-2 Ap 8 '15

Statistics of fire departments of American

Statistics of fire departments of American cities; tabulation. Munic Eng 49:sup45-57, sup57-8 S-O '15

See also Fire apparatus; Fire extinction: Fire protection

Fire engineers, International association of See International association of fire engineers

Fire engines

Centrifugal pumps for fire engine service; abstract. A. Schacht. Am Soc M E J 37:408-9
Jl '15

Fire engines, Motor
Efficiency of the chemical engine. I. W. Sibrel.
il Munic Eng 49:149-50 O '15

English motor fire engines, il Munic Eng 49: 26-8 JI '15

Gasoline pumping fire engines. E: F. Dahill. Munic J 38:469-70 Ap 8 '15

Testing

Tests of fire engines. Munic J 39:578-80 O 14

Fire extinction Extinguishing fire with kerosene. Sci Am S 80: 115 Ag 21 '15

Fire extinction—Continued
Fire: extinguishing a blaze by smothering or
by cooling. L. V. Redman. il Sci Am 111:494 D 12 '14

D 12 '14
Fire-extinguishing materials. Elec R & W
Elec'n 67:371 Ag 28 '15
Flue gases for extinguishing fire in coal, G:
Harker, J Ind & Eng Chem 7:801 S '15
Prevention of fire at sea. W. O. Teague. Eng
M 49:113-16 Ap '15

Fire hose. See Hose

Fire houses

Automobile fire stations; general plan of one story building for small cities and suburbs. A. S. Aungst. Munic J 38:656-7 My 13 '15 Fire engine house for a small town, il diags plan Bldg Age 37:37-9 F '15 Holyoke central fire station, il Munic J 38: \$83.44 Let 10 '15.

803-4 Je 10 '15
Trenton's new engine house designed for motor apparatus exclusively. il Munic J 38:655-6 My

Fire inspection

Fire inspections in Boston; abstract. J: Grady. Munic J 37:890 D 17 '14

Fire insurance. See Insurance, Fire

Fire places. See Fireplaces

Fire pots

Various constructions of charcoal fire pots. diags Metal Work 84:649-51 N 19 '15

Fire prevention. See Fire extinction; Fire protection

Fire protection

ire protection
Blower systems for heating and ventilating and stock and refuse conveying systems: committee report. A. M. Feldman. diags Am Soc Heat & V E 20:412-20 '14
Fire-fighting methods at the Mountain View mine, Butte, Mont. C. L. Berrien. 11 pls Am Inst Min E Bul 102:1215-45 Je '15
Fire prevention measures in the Equitable building. E: R. Hardy. il Arch & Bldg 47: 179-83 My '15
Fire prevention progress at Roston. For Decideration

179-83 My 15 Fire prevention progress at Boston. Eng Rec 70:629 D 12 '14 Fire protection for the factory, il Ind Eng 15: 1-5, 35-9, 61-6, 90-4 Ja-F, Ag-S '15 (to be

1-5, 35-9, 61-6, 90-4 Ja-F, Ag-S '15 (to be cont)

Fire protection on the national forests in 1914. H: S. Graves. Am For 21:47-50 Ja '15
Handling gasoline. Munic J 39, 315-16 Ag 26 '15
Hotels and fires. E: R. Hardy. Arch & Eldg 47:126-8 Mr '15
Insurance as an aid to engineers. N. H. Daniels. Boston Soc C E J 2:91-108 Mr '15
Minnesota highway commission aids in building firebreaks. Eng Rec 71:780 Je 19 '15
National fire protection association annual convention. Eng Rec 71:667 My 22 '15
Preparedness and fire protection. S. Brockwell. Munic J 39:319 Ag 26 '15
Problems in power-plant design. (Engineers' study course) C: L. Hubbard. Power 40:931-2; 41:32-4 D 29 '14-Ja 5 '15
Protecting congested districts in cities. R. M. Potts. Sci Am S 80:270-1 O 23 '15
Reducing the fire hazard in a factory. H. A. Russell. il Iron Age 96:741-3 S 30 '15
Safeguarding fire hazards in old buildings. Elec R & W Elec'n 67:992-3 N 27 '15
Safety precautions in New York subway; report made to the mayor by the city fire department. Elec Ry J 46:601 S 18 '15
Salem (Mass.) conflagration; with discussion. C: H. Smith il W S. E. J. 20:172-93 E N. M.

Salem (Mass.) conflagration; with discussion. C: H. Smith. il W Soc E J 20:172-92 F '15

Underwriters and fire protection association report on Edison fire, il diag plan Eng Rec 71:239-42 F 20 '15

See also Fire apparatus; Fire departments; Fire escapes; Fire extinction; Fire inspection; Fire service; Fireproof construction; Fireproofing; Forest fires; Inflammable liquids; Railroads-Fire protection

Laws and regulations

Garage men protest against 50-foot rule in New York, Horseless Age 35:138-40 Ja 27 '15 Regulations governing refrigerants in New York city. Power 40:862 D 15 '14

protection association, National. See Na-Fire tional fire protection association

Fire-resisting materials

ire-resisting materials
Concrete as fire-resisting material. T: A. Edison. Eng Rec 71:598 My 8 '15
Fire-resisting qualities of concrete. W: M. Kinney. Concrete Cem 6:40 Ja '15
Fire-resisting wood. Sci Am S 79:69 Ja 30 '15
Gypsum block in the Edison fire. S. G. Webb;
V. G. Marani. Eng Rec 71:88 Ja 16 '15
Sheet metal prevents spread of large fire. S. H.
Bunnell. il Metal Work 83:110-12 Ja 8 '15
Use of gypsum for fire protection. V. G. Marani. Eng M 48:596-8 Ja '15

See also Concrete construction—Fire resistance; Refractory materials

Fire service

Cincinnati builds high-pressure fire service system. J. A. Hiller, il diags Eng Rec 71:590 My 8 '15 Cincinnati high-pressure fire hydrants, diags Eng N 74:153 Jl 22 '15 Design details of the Cincinnati high pressure fire system, diags Eng & Contr 43:529-32 Je 16 '15

16 '15
Equitable hydrant rentals and better methods for apportioning fire protection cost. J: W. Alvord. Am Water Works Assn J 1:95-102 Mr '14; Same. Eng & Contr 41:579-80 My 20 '14; Same. Munic J 36:850-2 Je 11 '14; Same cond. Eng Rec 69:586-7 My 23 '14; Discussion. Am Water Works Assn J 1:538-45, 697-703 S-D '14

xperiences with electrically operated valve installations, under remote control, in New York city. A. Williamson. Eng & Contr 44: 225 S 22 '15 Experiences

225 S 22 15
Fire alarm attachment for recording pressure gauge. W. E. Haseltine, il diag Am Water Works Assn J 1:551-3 S '14; Same. Eng & Contr 42:453-4 N 11 '14
Functions of a water system with respect to domestic service and fire protection. E. B. Proctor. Eng & Contr 44:136-7 Ag 25 '15
Hydrant tests in Chicago indicate cheaper maintenance possibilities. il Eng Rec 71:483-4 Au 17 '15

maintenance possibilities, il Eng Rec 71:483-4 Ap 17 '15
National standard hose couplings and fittings for public fire service, il diags U S Bur Stand Circ 50:1-23 '14; Summary. Sci Am S 79:304 My 8 '15
Question box: Should private fire services be shut off, in case of fire in sprinkler protected buildings? Am Water Works Assn J 1:652-6 D '14
San Francisco's auxiliary pumping plants, Power 42:684-5 N 16 '15
San Francisco's auxiliary water-supply for fire protection. A. J. Cleary, il plan diags Eng N 73:290-7 F 18 '15
San Francisco's auxiliary water supply system

San Francisco's auxiliary water supply system for fire protection. M. M. O'Shaughnessy. Eng & Contr 44:294-5 O 13 '15

See also Fire apparatus; Hydrants; Standpipes; Water supply

Fire stations. See Fire houses

Firearms

Rifling of firearms, A, Keller, diags Sci Am S 79:277-8 My 1 '15

See also Artillery: Guns: Pistols; Rifles

Sights

Handicapping an army by poor sights. J. H. Parker. Sci Am S 80:280 O 30 '15 Telescope sights for fighting rifles. E: C. Crossman. il Sci Am 113:118-19 Ag 7 '15

Fireboxes, Locomotive. See Locomotive fireboxes

Firebreaks. See Fire protection

Firedamp Firedamp detector; abstracts. H. R. Webster. diag Eng M 49:108-9 Ap '15; Colliery 36:67-8

See also Mine gases

Fireflies

Experiments on the nature of the photogenic substance in the firefly. E. N. Harvey. diag Am Chem Soc J 37:396-401 F '15

Fireplaces

Efficient smokeless grate for domestic heating. il Sci Am 113:186 Ag 28 '15

Fire-place heater design competition, il Am Gas Light J 103:124 Ag 23 '15

Fireplaces -Continued

ireplaces — Continued Monumental treatment of the fireplace, D: E. Fulton, il diags Brickb 23:297-300 D '14 Open fireplaces as auxiliary heaters, T. W. Reynolds, diag Metal Work 82:741 D 4 '14 Proportioning fireplaces and flue areas, Metal Work 82:800 D 18 '14 Vogue of the wood-burning fireplace, S. C. Covert, il Bldg Age 37:47-8 N '15

See also Mantels Fireproof construction

Ineproof construction
Concrete construction and the Edison fire.
L. C. Wason. Textile World 48:537-40 F '15
Example of fire-resistant windows and structure: building for the Reliance gauge column co., Cleveland, Ohio. il Eng N 72:1331 D 31

Fire protection for the factory. il Ind Eng 15: 1-5, 35-9, 61-6 Ja-F, Ag 'l5

Fire-resisting qualities of concrete buildings at the Edison factory, West Orange, N. J. il plan Concrete Cem 6:29-30 Ja 'l5

Floor surfaces in fireproof buildings; abstracts. S. E. Thompson. Ind Eng 14:451-4 D 'l4: Iron Age 94:1527 D 31 'l4: Am Soc M E J 37:7-8 Ja 'l5: Sci Am S 79:410-11 Je 26 'l5

Rapid destruction of fireproof buildings: results of the fire in the Edison works at West Orange, N. J. S. H. Bunnell. il Iron Age 94: 1381-3 D 17 'l4

Trend of modern home building. il plans Bldg Age 37:71-2 D 'l5

What is fireproof construction? Iron Tr R 56: 526 Mr 11 'l5

See also Building laws; Concrete con-

See also Building laws; Concrete struction; Concrete construction—Fire sistance; Fire-resisting materials; Page 1988 Concrete contions; Steel construction

Fireproofing

Fireproofing mine shafts, diags Colliery 35:

Fireproofing mine shafts. Eng & Min J 99: 421 F 27 '15 Fireproofing wood for passenger car construc-tion on British railways. Ry R 57:689 N 27

Tests of fireproofed wood. Eng N 74:309 Ag

See also Fireproof construction

Fires

Comments on the Edison fire. Eng N 73:38-40

Comments on the Edison fire. Eng N 73:38-40 Ja 7 '15
Concrete pavement damaged by a fire. C. C. Wiley. Eng N 73:936-7 My 13 '15
Disastrous fire at Edison factory. il plan Eng Rec 70:660-2 D 19 '14
Fire damages the Edison plant. il Elec W 64: 1132-3 D 12 '14
Fire in the Edison works at West Orange, N. J. il Eng N 72:1233-7 D 17 '14
Fire-resisting qualities of concrete buildings at the Edison factory, West Orange, N. J. il plan Concrete Cem 6:29-30 Ja '15
Fire wrecks Roebling insulated wire plant. il Eng Rec 71:123-4 Ja 23 '15
Fires in brick and frame houses; tabulation. Munic J 39:217-18 Ag 12 '15
Fixing legal responsibility for fires. O. B. McGlasson. Am Ind 15:31 F '15
Gasoline fires caused by frictional electricity. Elec R & W Elec'n 65:1227 D 26 '14
Hot chemicals and concrete formed slag at

Hot chemicals and concrete formed slag at Edison fire. Eng Rec 71:184 F 6 '15

Possibility of fire from locomotive sparks. Ry Age 58:267-8 F 12 '15

Rapid destruction of fireproof buildings: results of the fire in the Edison works at West Orange, N. J. S. H. Bunnell, il Iron Age 94:1381-3 D 17 '14

See also Bridges—Fires; Fire protection; Fires at sea; Forest fires; Mine fires; Tunnel fires

Fires at sea

Prevention of fire at sea. W. O. Teague. Eng M 49:113-16 Ap '15

Firing

Cleaning fires under boilers, diags Elec W 65:734-5 Mr 20 '15

Economical firing from a practical standpoint. R. J. Van Meter. Ry R 57:294-6 S 4 '15

Economy in use of fuel results in elimination of dense smoke. F. M. Logan. Eng Rec 72: 581-2 N 6 '15

uel economy on locomotives; committee report of the A. R. M. M. A. il Ry R 57:183-4

Ag 7 '15
German progress in steam boiler firing; abstract. Pradel. diags Am Soc M E J 37: 185-7, 235-6 Mr-Ap '15
Hand firing soft coal under power-plant boilers. H: Kreisinger, diags U S Bur Mines Tech Pa 80:1-77 '15; Abstract. Am Gas Light J 102:139-40 Mr 1 '15; Excerpt (Thickness of fuel bed for hand-fixed furnaces). Elec W 65:678 Mr 13 '15
Instructing firemen at Philadelphia water pumping stations. Eng & Contr 44:359 N 3 '15

Instructions for firing. Int Marine Eng 20:

136 Mr '15 Problems of furnace and boiler economy. A. L. Westcott. diag chart Elec W 66:583-6 S 11

Saving fuel in heating a house. L. P. Breck-enridge and S. B. Flagg. U S Bur Mines Tech. Pa 97:1-33 '15; Same (Firing various fuels in residence heaters). Metal Work 84:585-6, 613-15 N 5-12 '15

Sec also Stokers, Mechanical

Firing grounds. See Rifle ranges

First aid in illness and injury

irst aid in illness and injury
Berwind-White first-aid meeting. il Colliery
35:254-5 D '14
Chicago elevated first-aid system. H. E. Fisher. il map Elec Ry J 46:430-4 S 11 '15
Contest in rescue and resuscitation work between line crews. il Elec W 66:1015 N 6 '15
Don'ts for first-aid-to-the-injured corps. Eng & Min J 99:656-7 Ap 10 '15
First aid at Ray Consolidated, Ray, Ariz. J. T. More. Eng & Min J 100:594-5 O 9 '15
First-aid bett. il Elec W 66:881 O 16 '15
First-aid instructions for miners. M. W. Glasgov, W. A. Raudenbush, and C. O. Roberts. il U S Bur Mines Circ 8:1-64 '15
First-aid kit. Eng & Min J 99:490-1 Mr 13 '15
First aid treatment. Metal Ind n s 13:110-11 Mr '15

1b 1b 1structions for first-aid treatment. M. W. Alexander. il Eng N 73:284 F 11 '15; Same. Eng & Min J 99:386-7 F 20 '15 N. A. S. O. first aid jar. il Ry Age 58:64 Ja 8 '15; Foundry 43:73-4 F '15; Power 41:185-6 F 9 '15

F 9 '15
N. A. S. O. standard first aid jar. M. W. Alexander. il Am Ind 15:24-7 Ja '15; Same. Ind Eng 14:456-7; 15:20-1 D '14-Ja '15; Excerpts. Iron Tr R 55:1135-6+ D 17 '14; Excerpts. Am Gas Light J 102:11-12 Ja 4 '15
Safety in foundry operations. M. W. Alexander. il Metal Ind n s 13:284-6 Jl '15
Safety in stone quarrying; common injuries and their treatment. O. Bowles. U S Bur Mines Tech Pa 111:38-43 '15

See also European war—Medical and sanitary affairs; Mine rescue work; War—Relief of sick and wounded

Fish waste

Composition of certain fish fertilizers from the Pacific coast and the fertilizer value of de-greased fish scrap, J: R. Lindemuth. il J Ind & Eng Chem 7:615-19 Jl '15

Fisheries

See also Pearl fisheries

Fishes

Effect of water pressure upon the form of fishes. il Sci Am S 78:376-8 D 12 '14

European markets for fish. U S Bur For & Dom Com misc ser 25:1-36 '15

See also Aquariums

Fitchburg, Mass. Sewerage

Constructing the Fitchburg sewage-works. F. A. Marston, il diags Eng N 74:4-6 Jl 1 '15 Sewage disposal works at Fitchburg. D: A.
Hartwell. il fold maps Boston Soc C E J 2:
203-22 Je '15

Fitting (machinery)
Adjusting tolerances for bolts, nuts, screws and taps. Iron Age 95:377 F 11 '15

Fitting (machinery)—Continued
Allowances and tolerances. Mach 21:486 F '15
Allowances for gas engine piston fits: abstracts. E. W. Weaver. Mach 21:491 F '15;
Horseless Age 35:110-11 Ja 20 '15; Power 41:
245 F 16 '15
Electric heater for shrink fits. il Elec Ry J
46:960-1 N 6 '15
Heating hub bolts for shrinking large flywheels together. H. B. McDermid. Eng N
73:587 Mr 25 '15
Method of making a shrink fit W. Swaren il

73:587 Mr 25 '15 Method of making a shrink fit. W. Swaren, il Power 40:816 D 8 '14

Flange facing machine Detrick & Harvey flange facing machine, il Mach 21:680-1 Ap '15

Flange oilers. See Locomotives-Lubrication

Flanges. See Pipe flanges

Flashlamps. See Electric lamps, Pocket

Flax and hemp supply, C; R. Dodge, Textile World 48:475-8 F '15 Netherlands flax crop. C; R. Dodge, Textile World 49:95 Ap '15

Destruction of flies and disinfection. Sci Am S 80:112 Ag 14 '15
Fly exhibition. Sci Am S 80:135 Ag 28 '15
Model of musca domestica 64.000 times life size. J. W: Grigg. il Sci Am 112:457 My 15 '15

Swat the fly eggs. il Sci Am 112:613 Je 19 '15

Flint, Michigan Flint—second city of automobile industry. L. V. Spencer. il Automobile 32:569-75 Ap

Flong machine Rivett flong machine. A. W. Birdsall, il In-land Ptr 55:95-6 Ap '15

Flood control

East side levee and sanitary district. T. N. Jacob. il diags map Assn Eng Soc J 55:1-11

Jl '15
Engineering lessons from the Ohio floods. J: W.
Alvord. il Boston Soc C E J 1:85-108; Discussion. 1:109-17 Mr '14
Erie can remove flood menace by spending \$798,000 on Mill creek improvement. F. Gannett. il diags map Eng Rec 72:440-2 O 9 '15
Erie flood-protection report. diags Eng N 74: 937 N 11 '15

nett. il diags map Eng Rec 72:440-2 O 9 '15
Erie flood-protection report. diags Eng N 74:
937 N 11 '15
Flood prevention plans for Dayton, Ohio. W:
S. Crandall. map Munic Eng 49:103-4 S '15
Flood prevention undertakings in Ohio; proceedings under new conservancy law. Eng & Contr 45:sup21 Je 9 '15
Flood protection in China; report of the board of engineers. Eng N 72:1231 D 17 '14
Flood-protection work on Fall creek at Indianapolis, Ind. L. F. Wertz. il diags map Eng N 72:1120-3 D 3 '14
Flood relief in the Huai river district of China. map Engineer 120:331 O 8 '15
High levees will protect Indianapolis from floods. il map Eng Rec 72:560-2 N 6 '15
Indianapolis flood protection. il map Eng N 74:961-5 N 18 '15
Indiana's flood protelms. W. K. Hatt. Eng Rec 71:169 F 6 '15
Miami conservancy district established. map Eng & Contr 44:sup29 J1 7 '15
Progress on the Miami valley flood-prevention work. map Eng N 74:92 J1 8 '15
Proposed method of enclosing a stream in reinforced concrete conduit through Mansfield, Ohio. C. L. Bushey. diag Eng & Contr 43: 126-7 F 10 '15
Report on flood prevention in China. il Eng Rec 70:679-80 D 19 '14
Securing popular support for a great project. S. H. Ankeney. il Eng Rec 70:646-8 D 12 '14
\$16,000,000 required for Los Angeles county flood protection. il diags map Eng Rec 72: 204-6, 232-3 Ag 14-21 '15
Why rivers overflow: how floods may be prevented. A. E. Morgan. il diags Sci Am S 78: 392-4 D 19 '14
Sec also Snow surveys

See also Snow surveys

Floodgates

Davey's models of automatic sluices and flood gates, il diags Engineer 119:410-11 Ap 23 '15

Floodlighting. See Light projection

April floods in Texas, B. Bunnemeyer, Eng N

(4:152 Jl 22 15)
Concrete work withstands severe tests in Erie flood. L: R. Ferguson, il Concrete Cem 7: 148-50 O '15

Destruction wrought by Erie flood, il Elec W 66:489-92 Ag 28 '15 Effect of recent floods on railways, il Ry Age 59:729-32 O 22 '15

59:729-32 O 22 '15
Eric rainstorm and flood, il map Eng N 74:
326-9 Ag 12 '15
Flood damage to railroads in Middle west, il
Ry Age 59:393-4 Ag 27 '15
Power plant and the Ohio flood, F. C. Caldwell, Sibley J 29:175-8 Mr '15

Restricted stream channel responsible for Erie flood damage. T. E. Seelye. il Eng Rec 72: 186-9 Ag 14 '15

See also Flood control

Floors

Decorative value of tile flooring. Bldg Age 37: 33-4 My '15 33-4 My

33-4 My <sup>15</sup> Floor surfaces in fireproof buildings; abstracts. S. E. Thompson. Ind Eng 14:451-4 D '14; Iron Age 94:1527 D 31 '14; Am Soc M E J 37: 7-8 Ja '15; Sci Am S 79:410-11 Je 26 '15 Hazards of factory floors. il Am Ind 15:supl-4

Tie-rods for floor arches; a criticism of current practice. F. N. Kneas, diags Eng N 73:518-19 Mr 18 '15

Tie-rods in tile-arch floors. G. Aus. Eng N 73:743 Ap 15 '15 Use of wood blocks for floors. il Iron Tr R 56:521-2 Mr 11 '15

See also Bridges-Floors; Building; Pave-

Cost

ost of a damp-proof timber floor, J. A. Holmes. Eng N 72:432-3 Ag 27 '14; Same. Ind Eng 14:372-3 S '14; Same. Bldg Age 37: 48 Ap '15 Cost

48 Ap '15 Cost of floors for buildings. S. E. Thompson. Eng Rec 70:652 D 12 '14

Testing

Hollow-tile partitions and floor arches tested. diags Eng Rec 71:432 Ap 3 '15 Using water as load in a floor test, F. R. Mc-Millan. il Eng N 72:1168-9 D 10 '14

See also Floors, Concrete-Testing

Floors, Concrete

loors, Concrete
Chicago engineer experiments with the dusting
of concrete floors. Eng Rec 71:155 Ja 30 '15
Cinder concrete floors. G. B. Waite. diags Eng
& Contr 41:600-3 My 27 '14; Same cond. Ind
Eng 14:302-4 Jl '14; Discussion. Eng & Contr
42:512-15 D 2 '14
Concrete dance floors. H. Laughlin, jr. Concrete Cem 7:34-5 Jl '15
Concrete floor hardening system. Eng N 73:

Concrete Cem 7:34-5 J1 15 Concrete floor hardening system. Eng N 73: 221 F 4 '15 Concrete floor troubles. M. D. Campbell. Ry Age 59:965-6 N 19 '15 Concrete floors for stables. L. C. Wason. Con-crete Cem 6:42-3 Ja '15 Concrete floors in dwelling houses. H. Laugh-

crete Cem 6:42-3 Ja '15 Concrete floors in dwelling houses. H. Laugh-lin, jr. Concrete Cem 6:41 Ja '15 Design and construction of Massachusetts in-stitute of technology buildings. S. E. Thomp-son. il diags plan Concrete Cem 7:14-19 JI '15; Same. Eng & Contr 43:513-18 Je 9 '15; Same cond. Eng Rec 71:748-50 Je 12 '15 Dustless concrete floors. il Eng Rec 70:607 D

5 '14

Economic design of concrete slabs. J. N. Jensen. Eng Rec 71:170-1 F 6 '15
Experiments to determine the cause of dusting of concrete floors. Eng N 73:228-9 F 4

The Tiber of The Tiber of The Tiber of Tiber of

Floor construction for driveway in canning factory. Concrete Cem 7:114-15 S '15 Linseed oil cures dusty concrete floors. Eng Rec 71:294 Mr 6 '15 n canning

Floors, Concrete—Continued

New and simple method for securing dustless concrete floors; with discussion. P. M. Bruner. Concrete Cem 6:118-19 Mr '15; Same. Assn Eng Soc J 54:142-9 Ap '15

New method for concrete flooring. Sci Am 112:

New method for concrete flooring, Sci Am 112: 191 F 27 '15

New system of adjustable concrete floor forms. i diags Concrete Cem 6:269-70 My '15

New tile and concrete floor, diags Eng N 73: 1183 Je 17 '15

Prevention of dusting of concrete floors. J. P. H. Perry. Concrete Cem 7:188 N '15

Reinforcing details of Delco building, Dayton, Ohio, diags Eng N 74:874-5 N 18 '15

Remedy for dusting concrete floors. Elec Ry J 46:20 Jl 3 '15

Renewing a basement floor. L. C. Wason; A. M. Smith. Concrete Cem 6:40 Ja '15

Strength and other properties of typical cinder concrete used in floor construction in New York. H. Perrine and G: E. Strehan. Eng & Contr 43:301 Mr 31 '15

Suggestions for light concrete floor construction in the concrete house. M. D. Morrill. diags Concrete Cem 6:35 Ja '15

## Testing

with conclusions and recommended methods of design. H. Perrine and G. E. Strehan. Eng & Contr 43:379-83 Ap 28 '15
Severe tests show Chicago municipal pier to be sound in construction. il Eng Rec 72:75
J1 17 '15
Test of load-distributions of the concrete statement of the contraction of the contract

Test of load-distributing action of floor arches F. N. Kneas. diag Eng N 73:1025 My 27 '15 F. N. Kneas, diag Eng N 73:1025 M Testing cinder concrete floors. H. Concrete Cem 6:25 Ja '15

Floors, Metal plate Metal plate floor shop. J. J. Turtletaub. il Iron Age 95:239 Ja 28 '15

#### Floriculture

See also Electrohorticulture: Plant breed-

## Florida

Sce .also Roads-Florida

## Industries and resources

Phosphate rock industry of Florida. L. V Tucker. il Boston Soc C E J 1:509-22 D '14

Florida East Coast railway To Cuba by rail. H. C. Plummer, il map Sci Am S 79:40-1 Ja 16 '15

Flotation process
Bradford selective flotation. Eng & Min J 100: 562 O 2 '15

Callow pneumatic process of flotation, il plan Met & Chem Eng 13:571-2 S 1 '15 Concentrator of the Timber Butte milling co., Butte, Mont. T. Simons. Am Inst Min E Bul 102:1305-6 Je '15; Abstracts. Met & Chem Eng 13:448-9 Jl '15; Eng & Min J 99:991 Je

5 '15
Development of ore concentration. H: A: Marvin. Eng M 49:229-30 My '15
Flotation as a conservation measure. Met & Chem Eng 13:344-5 Je '15
Flotation at the Consolidated Arizona smelting co., Humboldt, Arizona, flow sheet Met & Chem Eng 13:897-901 D 1 '15
Flotation in gold metallurgy. W. B. Blyth, Met & Chem Eng 13:308 My '15
Flotation of Joplin-Galena slimes. G: Belchic and G. L. Allen. Met & Chem Eng 13:847 N 15 '15

Flotation process. Eng & Min J 99:99-100 Ja 9

Flotation suit. Met & Chem Eng 13:409-11 Jl

Flotation testing machine, il Met & Chem Eng 13:930 D 1 '15

Flotation testing machine, R. W. Smith, diags Eng & Min J 100:395-6 S 4  $^{\prime}15$ 

Flotation tests on ores from Bisbee and Cobalt. H. J. French. bibliog Sch Mines Q 36:57-67 N '14; Abstract. Met & Chem Eng 13:509 Ag

Individual motor drive as used in the oil flotation process. W. M. Hoen. Am Inst E E Pro 34:3011-13 D '15

Liquid jets, C. T. Du Rell, Met & Chem Eng 13:714-16 O 15 '15

New copper metallurgy. H. A. Megraw. il Eng M 48:677-9 F '15 New flotation experiment. Eng & Min J 100: 900 N 27 '15

900 N 27 '15 New flotation installations. Eng & Min J 100: 668 O.23 '15 Notes on flotation. J. M. Callow, diags flow sheets Am Inst Min E Bul 108:2321-39, D '15 Recent progress in flotation. O. C. Ralston and F. Cameron. Eng & Min J 99:937-40 My 29 '15; Discussion. 99:1084; 100:68 Je 19, Jl 10

Testing oils for flotation process; abstracts. J. Coutts. Met & Chem Eng 13:389-90 Je '15; Eng & Min J 99:1079-80 Je '15
Two historical notes on flotation. W. F. Copeland, D. Butler and J. H. Wise. Met & Chem Eng 13:471-2 Ag '15; Same. Sci Am S 80: 182 S 18 '15
Unsettled petant little.

182 S 18 19 Unsettled patent litigation. Eng & Min J 99: 253 Ja 30 '15 Use of coal tar in flotation. W: A. Mueller. Eng & Min J 100:591-3 O 9 '15

Contributions of the chemist to the flour industry. J: A. Wesener and G: L. Teller. J Ind & Eng Chem 7:283-5 Ap '15 New whole wheat flour. C: Maxaner. Sci Am 112:67 Ja 16 '15

See also Banana flour; Corn meal

Flour mills

Apparatus for cleaning, separating and de-livering grain, il diags Engineer 119:338 Ap

Application of electric drive in flour mills and similar industries; abstract. T. E. Simpers. Elec R & W Elec'n 66:192-3 Ja 30 '15
Detroit flour-mill plant. T: Wilson. il plan Power 40:870-3 D 22 '14
Electric motor drive: method of interlocking machines for simultaneous operation in the new plant of the Commercial milling company, Detroit, Mich. il diags plan Elec W 65:105-9 Ja 9 '15
Motor sizes for flour-mill machinery. Elec W 65:418-19 F 13 '15; Same cond. Ind Eng 15: 83-4 Ag '15

Flue dust

Case for copper hydrometallurgy; inexpensive and efficient treatment of smelter flue dust carbonate ore. G: C. Westby, il Met & Chem Eng 13:295-7 My '15

Eng 13:295-7 My '15
Flue dust sintering plant at Gary, Ind. il plan
Iron Age 95:1168-70 My 27 '15
Mechanical progress of sintering. B. G.
Klugh, diags Iron Tr R 57:335-8+ O 28 '15;
Same. Iron Age 96:1000-4 O 28 '15; Discussion. H. A. Brassert. Iron Tr R 57:345 O 28
'15; Discussion. R. E. Brooke; H. A. Brassert. Iron Age 96:1004-5+ O 28 '15

Metallysical area of the Full Report of the State of

Metallurgical smoke, C: H. Fulton, U S Bur Mines Bul 84:27-32, 38-44 '15

Recovery of flue-dust iron. R. Baggaley. Iron Age 95:1109 My 20 '15

Utilizes flue dust by mixing with iron. diag Iron Tr R 57:358 Ag 19 15

Sce also Blast furnace gas; Blast furnaces; Briquets (iron); Sintering; Smelting

Flue das

Calculating dry flue-gas loss. C. W. Hubbard. Power 42:746-8 N 30 '15

Cinder removal from flue gases. C. B. Grady. diag Eng M 48:905-7 Mr '15

Flue-gas collector, C. H. Bean, diag Power 42:763 N 30 '15

Flue-gas collector. F. Power 42:489-90 O 5 '15 W. Fischer, diag

lue-gas sample collector. J: Morlock. Power 42:727-8 N 23 '15

How much CO<sub>2</sub> to expect with various kinds of fuel. V: J. Azbe. Power 42:712-14 N 23 '15

Measurement of flue-gas temperature. F. T. Leilich. Elec W 65:901 Ap 10 '15 See also Blast furnace gas

Automatic volumeter; abstract. E. G. Hopson. diag Am Soc M E J 37:722-3 D '15

Fluids -Continued

Flow of viscous fluids through smooth c cular pipes. C: H. Lees. Am Soc M E 37:242 Ap '15 cir-

See also Gas flow; Gases; Hydraulics; Hydrodynamics; Liquids; Osmosis; Solution (chemistry); Steam flow; Viscosity

Flumes

(chemistry); Steam flow; Viscosity Flumes
Construction of timber logging flumes. diag Eng & Contr 42:183-4 Ag 19 '14
Flume without side braces. B. A. Heinly, il diag Eng N 74:172 Jl 22 '15; Same. Eng & Min J 100:354-5 Ag 28 '15 Same. Eng & Min J 100:354-5 Ag 28 '15 Handling hydraulic fill on Piute dam. J. Jenson. il diag Eng Rec 72:80-1 Jl 17 '15
Hydrostatic catenary flume on a concrete aqueduct. H. B. Muckleston. il diags map Eng N 74:88-63 Jl 8 '15
Irrigation flumes of ingot iron, il Eng N 72: 1314-15 D 31 '14
Large, long reinforced-concrete flume of catenary section. Eng N 72:1267-8 D 24 '14
New rating flume for current meters, Bureau of standards. il Eng N 73:1127 De 10 '15
Proposed government testing flume for hydraulic turbines not needed. H. B. Taylor. Eng Rec 72:321-2 S 11 '15
Recommendations for values of n for different kinds of irrigation channels. F. C. Scobey. Eng & Contr 44:57-60 Jl 21 '15
Timber flume for water power in British Columbia. C: A. Lee. diag Eng & Contr 44:398 N 17 '15 N 17 '15

See also Hydroelectric plants; Irrigation canals

Fluorescence

Fluorescence of petroleum distillates. B: T. Brooks and R. F. Bacon. Sci Am S 79:61 Ja 23 '15

Fluorine

Quantitative determination of fluorine, W: H. Adolph, diag Am Chem Soc J 37:2500-15 N 2'15

Syntheses in the diphenylmethane series. L. Thorp and E. A. Wildman, Am Chem Soc J 37:372-7 F '15

Fluorspar

Action of fluorspar on basic open-hearth slags. W. S. Hamilton, Met & Chem Eng 13:8 Ja

Fluting

Automatic machine for fluting drills. il Iron Age 95:720 Ap 1 '15; Iron Tr R 56:680 Ap 1 '15; Mach 21:683 Ap '15

Fluxes for oxy-acetylene welding. P. F. Willis; S. W. Miller. il Mach 21:1007-8 Ag '15 Fluxes for oxy-acetylene welding. S. W. Miller. il Mach 21:786-9 Je '15 Phosphate rock as furnace flux. J. A. Barr. il Iron Tr R 56:183-5 Ja 21 '15

Fly traps

Suction fly catcher. F. C. Perkins. il Sci Am 113:236 S 11 '15

Flying boats Experiments xperiments with flying boat hulls. C. H. Butman, il Sci Am S 79:148 Mr 6 '15

Flying-boat hulls. W: H. Fauber. Sci Am S 79:407 Je 26 '15

Flying machines

Bronze in history-making: an ancient figured bronze door reveals the aerial-navigation engineering of antiquity. L. Lodian. il Metal Ind n s 13:51-3 F '15

See also Aeroplanes

Flywheel explosions Fly-wheel explosions, 1914. Locomotive 30: 152-3 Ja '15

Two flywheels explode at Illinois steel co.'s plant. Power 41:491-2 Ap 6 '15

Unusual fly-wheel explosion at Nelsonville, O. il Locomotive 30:172-5 Ap '15

Flywheels

Handy flywheel calculator, il Power 42:683 N 16 '15

uge flywheel for Ford plant. il Automobile 32:505 Mr 18 '15

Large wooden flywheel, il diag Power 41:439-40 Mr 30 '15

Machining flywheels. il diags Mach 21:813-15

Fodder. See Feeding and feeding stuffs

Fog signals

og signals
Fog and fog signals. E. O. Catford. Engineer
119:129-30 F 5 '15
Fog signals through air and through water.
R. F. Blake. Sci Am 111:507 D 19 '14
Providing a ship with ears; a system for locating other ships and icebergs during fog.
il R. G. Skerrett. Sci Am 113:450 N 20 '15
Submarine signalling. Engineer 119:446 My 7
'15; Same. Sci Am S 80:168-70 S 11 '15
Submarine signalling and proposed method of
safe navigation in fog: abstract. F. L.
Sawyer. Int Marine Eng 20:21-2 Ja '15

Folding machines

Accordion fold with the zig-zag folding machine. il Inland Ptr 56:120 O '15

Folk-lore, Medical. See Medical folk-lore

Follow-up system for the foundry. T. A. St. Clair, jr. Foundry 43:319-21 Ag '15

Food

Dried beer-yeast as an article of food. Sci Am S 79:311 My 15 '15 Food for polar explorers. E. Shackleton. Sci Am S 79:36-7 Ja 16 '15 Transforming sugar into proteins and fats. H. W. Hillyer. Sci Am 113:446+ N 20 '15

See also Bakers and bakeries; Bread; Butter, Substitutes for; Eggs; Flour; Food adulteration; Glucose; Mastication; Meat; Milk; Nutrition; Proteins; Syrups; Wood as

Analysis

Concise group method for the detection of gelatinizing agents, pasty material and thickeners, used in food products. L. A. Congdon. J Ind & Eng Chem 7:606-7 Jl '15 Examination of tomato pulp. W. D. Bigelow and F. F. Fitzgerald. J Ind & Eng Chem 7:602-6 Jl '15

See also Soy beans

Food laws

Pure food law. L: Hogrefe. J Ind & Eng Chem 7:1001-2 N '15

Food preservatives

Air ozonation. M. W. Franklin. J Ind & Eng Chem 6:853-4 O'14; Same. Am Soc Heat & V E 20:350-4 '14

Food supply

ood production in the United States. Sci Am 112:326 Ap 3 '15

Food waste Feeding the German nation in time of war. Sci Am 112:125 F 6 '15

Foot-and-mouth disease

Battle with foot-and-mouth disease. Sci Am 112:192 F 27 '15

Footbridges

Cost of railway footbridges. diags Engineer 120:197-9, 221-3, 240-2, 266-8 Ag 27-S 17 '15 Footings, Column. See Column footings

Forage plants

Chemical study of two drought-resisting for-age plants, S. Lomanitz, J Ind & Eng Chem 7:220 Mr '15

Force and energy

conversion of energy. (Engineers' study course) Power 41:103 Ja 19 '15
Energy contained in revolving wheels and locomotive side rods. W. E. Symons. Ry Age 59:455 S 10 '15

See also Dynamics; Electromotive force; Free energy; Mechanics; Pressure

Free energy; Mechanics; Pressure
Ford motor company
Details of the reinforced concrete building of
the Ford motor co., Chicago, Ill. il diags
Eng & Contr 42:220-2 S 2 '14
Ford averages 1027 cars a day. Automobile 33:
349-50 Ag 19 '15
Ford methods and the Ford shops. H. L.
Arnold; F. L. Faurote. il Eng M 47:1-26,
179-203. 331-58, 507-32. 667-92. 857-86: 48:
33-60, 187-212. 338-66, 524-50, 704-21, 859-76;
49:67-87, 184-201, 372-93 Ap '14-Je '15
Ford sociological work; results of second year
of profit-sharing. Iron Age 96:443 Ag 19 '15

Ford motor company—Continued
Foundry economies in the Ford motor plant, il
diag Iron Age 96:680-3 S 23 '15

diag Iron Age 96:680-3 S 23 '15
Heating and ventilating system that conserves
the comfort of 15,000 workers at the Ford
plant in Detroit. il Sci Am S 80:280 O 30 '15
Making of men, motor cars and profits. O. J.
Abell. il Iron Age 95:33-41+ Ja 7 '15
Shipping 2000 cars a day. M. Braun. il plan
Automobile 33:646-9 O 7 '15

Automone 53:040-9 O/ 19

Foreign bodies (surgery)

Determining the depth of a foreign substance in the body. Sci Am S 80:355 D 4 '15

Electro-magnet for removing particles of iron from the flesh. il Mach 21:601 Mr '15;

Elec R & W Elec'n 66:508 Mr 13 '15; Iron Age 95:452 F 25 '15; Iron Tr R 56:525 Mr 11 '15; Sci Am S 79:168 Mr 13 '15

Foreign trade. See Export trade

Foreign trade convention, National. See National foreign trade convention, 2d

oremen
Difficulties in increasing the scope of the section foreman's duties, J. P. Costello, Ry Age 58:1449-50 Je 18 '15
Points for the road foreman, W. P. Danforth, Ry Age 57:1130-1 D 18 '14
Training engine house foreman, R. G. Gilbride, Ry Age (Mech ed) 89:81 F '15
Value of a foreman in a brass manufacturing plant, P. W. Blair, Metal Ind n s 12:504 D '14

See also Mine foremen

Forest administration

Orest administration
Crisis in New York, H. H. Chapman, Am
For 21:168-71 Mr '15
National forest administration, D: F. Houston, Am For 20:867-9 D '14
Situation in Michigan, H. H. Chapman, Am
For 21:1066-8 N '15

See also Forest finance; Forest reserves

Forest conservation

orest conservation Destroying Mt. Mitchell. R. Pullman. il Am For 21:83-93 F '15 Forests and game preservation. O. H. Van Norden. il Am For 21:111-16 F '15 New York constitution. Am For 21:941-2 S '15 Philippine forest wealth. D. C. Worcester. il Am For 21:1-18 Ja '15

See also Forest reserves

Forest finance

orest finance
Bonding national forests. H: S. Graves. Am
For 21:59-63 Ja '15
New factor in forest finance. W. T. Christine.
Am For 21:1001-2 O '15
States get \$850,000 from national forests. Am
For 21:990-1 O '15

Forest fires

orest fires
Coal company practices forestry. A. C. Neumiller, il Am For 21:868-71 Ag '15
Dark days and forest fires. C. F. Talman.
map Sci Am 112:229 Mr 6 '15
Fire protection on the national forests in 1914.
H: S. Graves, Am For 21:47-50 Ja '15
National forest fires in 1914. Am Ind 15:34-5
Ja '15

Swedish forest fire insurance. Am For 21:531 Ap '15

Tackling Tamalpais, F: E. Olmsted, il Am For 20:887-93 D '14

Three miles of flame: a cross-country ride and three days of work with a fire warden in New England. A. Chamberlain. Am For 21: 64-7 Ja '15

Forest management

Northern hardwood forest; its composition, growth, and management. E. H. Frothing-ham. il U S Agric Bul 285:33-44 '15

Southern cypress. W. R. Mattoon, il map U S Agric Bul 272:50-70 '15

Forest planting

Methods employed in the reforestation of the Croton watersheds. T. C. Culyer. Eng & Contr 44:202 S 15 '15

Reforestation movement in China, W. F. Sherfesee, il Am For 21:1033-40 N '15 See also Tree planting

Forest products Work and som ork and some accomplishments of the forest products laboratory, Madison, Wis.; with discussion. H. F. Weiss, il diag W Soc E J 19:933-64 D '14

See also Gums and resins: Lumber: Wood

Forest products federation Tentative organization, E. A. Sterling, Am For 21:55-6 Ja '15

Forest reserves

orest reserves

Bonding national forests. H: S. Graves. Am
For 21:59-63 Ja '15

Forestry in Wisconsin. E. M. Griffith. Am For
21:559-62 Ap '15

Forests of the United States. L. Lundgren. il
map Eng M 50:1-17 O '15

Hunting on the national forests. H. A. Smith.
il Am For 21:172-82 Mr '15

Improved White mountain forests. W: L. Hall.
il Am For 21:172-82 Mr '15

Improved White mountain forests. W: L. Hall.
il Am For 21:172-82 Mr '15

National forest administration. D: F. Houston.
Am For 20:867-9 D '14

New England's federal forest reserve. P. W.
Ayres. il maps Am For 21:803-12 Jl '15

States get \$850,000 from national forests. Am
For 21:990-1 O '15

United States mining statutes annotated; forest reservation act. J. W. Thompson. U S
Bur Mines Bul 94:pt 2, 1166-77 '15

Weeks law conference. Am For 21:1004-5 O '15

See also Forests and forestry

See also Forests and forestry

Forest service (United States)
Clerk's work on a national forest. J. T. Shinn.
il Am For 21:653-6 My '15

Forest service and the prospector, L. A. Palmer, Colliery 35:511+ Ap '15

National forestry in Montana. F Assn Eng Soc J 54:175-98 My F. R. Ingalsbe.

Foresters

oresters in the German army. T. R. Helms. il Am For 21:527-31 Ap '15

Foresters in the great war. S: T. Dana. il Am For 20:858-67 D'14

Forestry. See Forests and forestry

Forestry association, American. See American forestry association

Forestry clubs
Township forestry club, G: B. Cobb. Am For 21:109 F '15

Forestry laws and legislation Federal and state forestry legislation, Am For 21:145-7 F '15

Texas forestry law. Am For 21:615-16 My '15

United States mining statutes annotated; timber cutting for mining purposes. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 1334-

Weeks law conference. Am For 21:1004-5 O '15 Wisconsin's forestry tangle, Am For 21:206-7

See also Forest reserves

Forestry schools and education

Oregon forest students, il Am For 21:740-2 Je

Yale forestry class in the woods. J. L. Good-win, il Am For 21:872-5 Ag '15 See also Colorado school of forestry

Forests, Municipal First town forest. Am For 21:1042 N '15 Harrisburg's municipal forest. H. J. Mueller. il Am For 21:732-5 Je '15

Forests and forestry

See also Forest conservation; Forest fires; Forest reserves; Foresters; Forests, Municipal; Landscape gardening; Pine; Tree planting; Trees; Wood; Woodlots

Belgium

Forests of Belgium. C: H. Whitaker. il Am For 21:22-32 Ja '15

Canada

Canadian lumber competition. H. D. Langille. il Am For 21:130-9 F '15

Reforestation movement in China. W. F. Sherfesee. il Am For 21:1033-40 N '15

## Forests and forestry—Continued

France

Great war's destruction of French forests. J. P. Alaux, il Am For 21:155-68 Mr '15

Germany

American trees in German forests. J. S. Illick. il Am For 21:922-7 S '15 Great war and German forests. P. Bigelow. il Am For 21:607-12 My '15

India

British India. U S Sp Cons Rep 72:399-408 '15 Japan

Forests of Japan. N. B. Eckbo. il Am For 21: 693-711 Je '15

Michigan

Situation in Michigan, H. H. Chapman, Am For 21:1066-8 N 15

Montana

National forestry in Montana, F. R. Ingalsbe, Assn Eng Soc J 54:175-98 My '15

North America

Northern hardwood forest; its composition, growth, and management. E. H. Frothing-ham. il map U S Agric Bul 285:1-79 '15

Philippine islands

Philippine forest wealth. D. C. Worcester. il Am For 21:1-18 Ja '15 Philippine forestry exhibit. A. T. Fischer. il Am For 21:997-9 O '15

Russia

Forests in the Russian war zone. E. Washburn, il Am For 21:755-67 Jl '15

Switzerland

How Switzerland cultivates her forests. M. Widmer, il Am For 21:847-50 Ag '15

United States

Forestry issue in the lake states, H. H. Chapman, Am For 21:656-9 My '15 Forests of the United States, L. Lunderen, il map Eng M 50:1-17 O '15

See also Forest reserves; Forestry service (United States)

Wisconsin

Forestry in Wisconsin, E. M. Griffith, Am For 21:559-62 Ap '15

Forge furnaces. See Furnaces, Metallurgical

Forge shops

Orge shops
Description of nut, bolt and rivet shop of
Upson nut co., Cleveland, with details of
arrangement and equipment. R. V. Sawhill,
il plan Iron Tr R 56:1245-54+ Je 17 '15
Modern automobile forge shop; Packard motor
car co., Detroit. F. A. Churchill, jr. il plans
Iron Tr R 57:829-32+ O 28 '15
New forge shop of Upson nut company, Cleveland, il plans Iron Age 95:1336-43 Je 17 '15
Utilizing waste heat in a drop forge shop; hot
gases from furnaces used to generate steam,
il diags plan Iron Age 95:45-7 Ja 7 '15

New also, Forging: Forging machinery

See also Forging; Forging machinery

Science and the forger; instruments and illustrations in questioned document cases. A. S. Osborn. il Sci Am 112:434-5 My 8 '15

Forging

Don'ts for drop-forge die hardeners and users. W. L. Goodrich. Mach 21:453 F '15 Drop forging. A. M. Tilton. Iron Age 95:1177-8 My 27 '15 Efficiency of forging hammers. C. H. Wack-ernagel. Mach 21:785 Je '15

Equipment for forging shrapnel cases. C. A. Tupper, Iron Age 96:512-14 S 2 '15
Forging shrapnel shells, I. T. Hamilton, I! diags Mach 21:614-18 Ap '15; Same, Sci Am S 79:404-6 Je 26 '15

Forging the shrapnel head, il diags Mach 21: 637-8 Ap '15

Master blacksmiths' convention; discussion of drop forging, il Ry Age (Mech ed) 89:476 S '15

Rolling tapered forgings. F. H. Blakeslee. il Mach 21:909-10 Ji '15 Why do you wet coal on the forge? L. K. Hirshberg. Colliery 35:414 Mr '15 Sec also Dies; Forge shops; Welding

Forging machinery
Forging machine dies. J. Lee. diags Ry Age
(Mech ed) 89:37 Ja '15
Forging machine dies. J. W. McDonald. il
diags Ry Age (Mech ed) 88:639-40 D '14
New forging slotter. il Iron Tr R 55:1088 D 10

14
Rolling tapered forgings, F. H. Blakeslee, il
Mach 21:999-10 Jl '15
Uses of the quick forging press; abstracts,
A. J. Capron, il diags Iron Tr R 57:683-5 O 7
'15; Iron Age 96:1224-5 N 25 '15
Form factor. See Electric waves

Formamid

Conductivity and viscosity of solutions of electrolytes in formamid. P. B. Davis, W. S. Putnam and H. C. Jones. il diags J Fr Inst 180:567-601 N '15

Formates

Studies in conductivity; the conductivity of some formates and of hydrogen chloride in (anhydrous) formic acid; cases of apparent agreement of strong electrolytes with the mass law. H. I. Schlesinger and A. W. Martin. diags Am Chem Soc J 36:1589-1620 Ag 74

Formic acid

ormic acid

Determination of formic acid in ketchup. C. A.

Peters and L. P. Howard. J Ind & Eng Chem
7:35-7 Ja '15

Free energy of formation of formic acid. G. E.
K. Branch. diags Am Chem Soc J 37:2316-26
O '15

Forsyth dental infirmary, Boston Two dental buildings. H. D. Eberlein. il plans Arch Rec 37:532-4 Je '15

Fort Worth, Texas

Bridges

Design and construction of the Main street reinforced concrete viaduct, S. W. Bowen, diags Eng & Contr 43:211-17 Mr 10 '15 Methods and costs in constructing the 450-ft. East Fourth street viaduct, E. W. Robinson, il Concrete Cem 5:231-8 D '14

Fortification

German on permanent fortifications. Sci Am 113:374 O 30 '15 Improvised defenses. il Sci Am S 80:100 Ag 14

Mining and countermining of fortifications. il Sci Am 111:464-5 D 5 '14

See also Coast defense; Intrenchments

Foundation soils

oundation soils

Boston foundations. J. R. Worcester, 26 fold
maps Boston Soc C E J 1:1-29 Ja '14; Discussion, 1:179-248, 395-417 Ap, S '14

City founded on sawdust; how part of Muscatine, Iowa, came to be built on such a foundation, diag map Eng Rec 71:496-7 Ap 17 '15

Data requested on the bearing value of soils. Eng & Contr 43:475 My 26 '15

Distribution of vertical soil pressures; tests at Engineering experiment station of Pennsylvania state college. J. A. Moyer, il Eng Rec 71:330-2 Mr 13 '15

Lateral pressure and resistance of clay and

Lateral pressure and resistance of clay, and the supporting power of clay foundations. A. L. Bell. Engineer 119:124 Ja 29 '15

Soil-bearing test with confined plunger, il diag Eng N 74:651-2 S 30 '15

Topography of the bed-rock under Chicago. R. Peattie, maps W Soc E J 19:590-4 Je '14'. Same cond. Eng & Contr 42:605-7 D 30 '14'. Discussion. W Soc E J 19:594-611 Je '14

Foundations

Anchoring foundation bolts in concrete. Croft. diag Power 41:841 Je 22 '15

Building a lighthouse on shifting sand, H. J. Shepstone. il Sci Am 112:227-8 Mr 27 '15 Concrete foundations for houses. G: L. Mc-Murphy. il diag Bldg Age 37:65-6 D '15

Concrete pile and cylinder foundations a Charleston, il diag Eng N 74:926-9 N 11 '15

Foundations-Continued

Construction of tower foundations; abstract. F. C. Connery, diags Elec W 66:136 Jl 17 '15 Court rules on validity of foundation patent. Eng Rec 71:154-5 Ja 30 '15

Court rules on valouty of foundation patent. Eng Rec 7:1:1-34-5 Ja 30 '15
Foundation work and the skyscraper. Sci Am 112:560 Je 5 '15
Foundations for high towers at Darien, C. Z. I. W. Dye. il diag Eng N 73:1178-9 Je 17 '15
Foundations for transmission line towers and tower erection. J. A. Walls; J. B. Leeper; W. E. Mitchell; P. M. Downing; F. C. Connery. diags pls Am Inst E E Pro 34:1167-97, 1369-77 Je-11 '15; Abstracts. Elec W 66:8-10 Jl 3 '15; Eng N 74:159-61 Jl 22 '15; Discussion. Am Inst E E Pro 34:3117-26 D '15 Grouting or cushioning stand pipe bases; abstracts. C: W. Sherman. Munic J 39:812 N 25 '15: Eng & Contr 41:49-11 N 24 '15
Methods and plant used in constructing the foundations for the Field museum of natural history, Chicago, Ill. il plans Eng & Contr 41:402-5 N 24 '15
Novel method of excavating for the foundation of a bank building in Stockholm, Sweden. K. P. Billner. Eng & Contr 44:112 Ag 11

'15
Pier and pile foundations on earth and rock. il plan Eng N 74:632-3 S 30 '15
Putting down deep foundation piers in Long Island City, diags Eng N 73:221-3 F 4 '15
Repairing building supports and foundations with concrete. il Concrete Cem 6:45-6 Ja '15
Retaining walls on soft foundations. W. S. Lacher. il diags W Soc E J 20:232-47 Mr '15: Same cond. Eng & Contr 43:576-9 Je 30 '15; Abstract. Ry Age 58:411-13 Mr 5 '15; Discussion. W Soc E J 20:247-65 Mr '15
Settlement of two grain elevators. Eng N 73: 872-3 My 6 '15
Sinking foundations through steel and con-

872-3 My 6 '15
Sinking foundations through steel and concrete, il Eng N 74:988-9 N 18 '15
Straightening a tall leaning tactory chimney by a new method. T: S. Clark, diags Eng N 73:266-7 F 11 '15: Same. Power 41:408 Mr 23 '15; Same, Eng & Min J 99:822 My 8 '15; Same, Ind Eng 15:66-7 Ag '15
Structural steel supports for large steam turbines, diags plan Eng N 73:66-9 Ja 14 '15
Tower foundations for the Cristobal-Balboa transmission line. I. W. Dye, il diags Eng Soc W Pa 30:973-90 Ja '15; Same, Ry R 56: 728-31 My 29 '15; Same cond. Eng & Contr 44:317-20 O 20 '15

\*\*Rec also Bridges—Foundations and piers; Building; Caissons; Cellars; Cofferdams; Column footings; Concrete piling; Cribs, Concrete; Dams—Foundations; Foundation soils; Pavements—Foundations; Piers; Piles and pile driving; Shoring and underpinning; Walls

Proper clothing prevents injury; what foundry operatives should wear, il Foundry 43:375-7+S'15; Same cond. Eng M 49:758 Ag'15

Founders' association, National. See National

Foundries

oundries
American bronze company's new plant, G: W.
Grupp, il plan Metal Ind n s 13:447-9 N '15
Buffalo electric steel foundry, H. C. Estep, il
plan Iron Tr R 55:215-20 Ja 28 '15; Same.
Foundry 43:1-6+ Ja '15
Converter foundry of large capacity. E. F.
Cone, il plan Iron Age 96:669-74 S 23 '15

Detroit steel castings company's plant. il plan Iron Age 96:701-6 S 23 '15

Floating foundry of the U. S. S. Vestal. F. M. Perkins. il plan Foundry 43:211-15 Je '15

Ford methods and the Ford shops. H. L. Arnold, il plans Eng M 48:524-50 Ja '15
Ford raw materials project. Iron Age 96:395
Ag 12 '15

Foundry construction for light castings, il plan Iron Age 96:917-21 O 21 '15

Foundry in Pittsburgh district: new plant of Cyclops foundry co. il Iron Tr R 56:174-5 Ja

Gray-iron foundry of instructive design; advantages of a clean and orderly operation as maintained by the Textile machine company, Reading, Pa. il Iron Age 95:987-91 My 6'15

How boiler and greenhouse parts are molded. E. C. Kreutzberg, il plan Foundry 43:253 Jl E.

E. C. Kreutzberg. II plan Foundry 43:253 J1 '15
How titanium-aluminum bronze is produced. C. Vickers. il Foundry 43:277-8 J1 '15
Implement foundry of Deere & co. il Iron Age 95:88-92 Ja 7 '15
Interesting steel casting plant; Dutcher works of the Prime steel co., Milwaukee. il Iron Tr R 56:427-8 F 25 '15
Iron foundry for Werner & Pfleiderer company's manufacturing plant, Saginaw, Mich. il diag plan Iron Age 96:688-91 S 23 '15
Metamorphosis of the foundry. R. A. Bull. Iron Tr R 57:637-8+ S 30 '15
Modern sheet metal machinery plant. il plans Metal Work 83:127-9 Ja 15 '15
New foundry for making machinery castings; equipment of the Putnam machine co., Fitchburg, Mass. il Foundry 43:281-2 J1 '15
New malleable foundry; plant of Hammond malleable iron co. il plan Iron Tr R 56:559-60 Ap 29 '15; Same. Foundry 43:204-5+ My

Problems involved in industrial pioneering. L. L. Anthes. Foundry 43:82-3 F '15 Studebaker corporation gray-iron foundry at South Bend, Ind. il Iron Age 95:840-1 Ap 15

Two-story foundry for continuous operations. G. K. Hooper. Foundry 43:185-6 My '15

See also Brass foundries; Electricity in foundries; Founders; Foundry accounting; Foundry management; Foundry practice, and other headings beginning Foundry

#### Accidents

When the ladle chain broke. L. Forrester. Foundry 43:261-2 Jl '15

#### Equipment and supplies

Equipment and supplies

Agricultural castings made at minimum cost; modern foundry at Moline, Ill. J. F. Ervin. il plans Foundry 43:85-92 Mr '15

Annual exhibit of foundry equipment. il Iron Age 96:824-6 O 7 '15

Brass foundry equipment and management. W. H. Parry. Metal Ind n s 13:61, 186, 452 F, My, N '15

Core-oven mechanical draft installation. il diag Iron Age 96:1163-4 N 18 '15

Cranes for the machine shop and foundry. H. M. Lane. diags Iron Age 96:246-8 Jl 29 '15

Efficient methods of the Yale & Towne mfg. co. and details of its specially-equipped shop. H. C. Estep. il plans Foundry 43:129-37 Ap '15; Same (Castings for locks and hardware). Iron Tr R 56:809-16+ Ap 22 '15

Exhibitors and what they'll exhibit: Atlantic City, Sept. 25-Oct. 1, 1915. Foundry 43:341-4 S '15

Foundry and machine exhibition, Atlantic

y and machine exhibition, Atlantic Sept. 25-Oct. 1. il Foundry 43:398-404

Foundry core print rack. W. H. Parry, jr. Foundry 43:454 N '15 Foundry exhibits at Atlantic City. il Iron Tr R 57:639-44 S 30 '15

Foundry tumbling barrel, il Iron Age 94:1525 D 31 '14 Handy flask clamp, J. F. Buchanan, il diag Foundry 43:242-3 Je '15

How boiler and greenhouse parts are molded. E. C. Kreutzberg. il plan Foundry 43:249-57 Jl '15

Improved drop release for foundry scrap breaker. J: V. Pierce. diag Mach 21:496 F '15

Labor saving devices in Texas foundry. Iron Age 95:341-3 F 11 '15

Miscellaneous stands for use in the foundry. A. Hill. diags Foundry 43:301-3 Ag '15

Modern foundry pig-iron mixer; operating and chemical results with blast-furnace and coke-oven gases; abstract. O. Simmersbach. Iron Age 96:812-13 O 7 '15

Modern iron founding. R. Onions. il diags Engineer 119:411-13 Ap 23 '15

Selecting grinding wheels for foundry use. C. F: Dietz. Foundry 43:115-20 Mr '15; Same. Iron Tr R 57:314-18+ Ag 12 '15

Skim gate that skims. J. H. Anderson. diags Foundry 43:243 Je '15

Foundries—Equipment and supplies—Continued Snap flasks, Metal Ind n s 13:64-5 F '15

See also Casting machines; Crucibles; Electricity in foundries; Fire brick; Foundries—Safety devices; Foundry machinery; Molding machines; Sand, Foundry

# Inspection

How the product of the foundry is inspected. E: Godfrey. Foundry 43:222-4 Je '15; Same cond. Iron Age 95:898-9 Ap 22 '15

### Laws and regulations

See Foundry laws

#### Lighting

Artificial light for foundries. Eng M 49:589 Jl

Good light—a safety factor in casting plants. Foundry 43:216-18 Je '15

## Safety devices and measures

Chipping boss as an optimist. C. Yost. diags Foundry 43:463-4 N '15 Fifty safety rules for the operation of cranes. Foundry 43:16-17 Ja '15

Good natural light-a safety factor. Eng M 49:

Good natural light—a safety of cupola operations.
435-6 Je '15
How to increase safety of cupola operations.
il diag Foundry 43:445-6 N '15
National founders' association 19th annual convention. Iron Age 96:1243 N 25 '15
National safety council foundry safety meeting; abstracts of papers. Iron Age 96:982-3 O 28 '15
Chie foundry conference. Iron Age 95:1014-15

My 6 '15

Proper clothing prevents injury, il Foundry 43:375-7+ S '15; Same cond, Eng M 49:758 Ag '15

43:362-1+ S 15; Same cond. Eng M 49:68 Ag '15 Safe wheelbarrows and trucks. diag Ind Eng 15:43-4 F '15; Same. Foundry 43:265-6 Jl '15; Same cond. Am Ind 15:sup1-4 Jl '15 Safety in foundry operations. M. W. Alexander. il Metal Ind n s 13:198-9, 242-3, 284-6 My-Jl '15

Safety in tumbling mill operations, il diag Foundry 43:144-5 Ap '15

## Ventilation

Efficient methods of the Yale & Towne mfg. co. and details of its specially-equipped shop. H. C. Estep. il Foundry 43:133-5 Ap '15; Same (Castings for locks and hardware). Iron Tr R 56:810-14 Ap 22 '15

Foundry accounting
American foundrymen's association committee
recommends universal cost keeping system.
Foundry 43:451-4 N '15

Analysis of the foundry cost. J. K. Mascn. Foundry 43:8-12 Ja '15

Cost keeping in the brass foundry, Skeeper. Metal Ind n s 12:497-9 D '14

Finding costs in the steel foundry. G. Muntz Iron Tr R 57:482-4 S 9 '15

Revision of the A. F. A. standard cost system, H. Emerson, Foundry 43:7-8 Ja '15

Uniform basis for figuring foundry costs, Iron Age 96:1118-21 N 11 '15

Foundry costs
Cupola operation for continuous pouring. J. F.
Ervin. il Iron Age 96:183-5 Jl 22 '15

Graphic method of estimating core costs. E: S. Dean. Iron Age 95:1012 My 6 '15

Sec also Foundry accounting

Foundry education. See Foundry practice— Study and teaching

Foundry laws
New York state rules governing casting plants.
Foundry 43:295-7 Ag '15; Same. Iron Tr R
57:312-13+ Ag 12 '15

Pennsylvania foundry code. Iron Age 96:955-6

Foundry machinery Crane sand cutting machine, il Iron Tr R 56: 88-90 Ja 7 '15; Same, Foundry 43:77-9 F '15 Duplex shaker, il Metal Ind n s 13:434 O '15

How to make cores in multiple, il Iron Tr R 56:180-2 Ja 21 '15

Industrial control in the foundry. R. H. Mc-Lain. il Am Inst E E Pro 34:587-97 Ap '15; Same. Foundry 43:201-3 My '15; Abstract, with discussion. Elec R & W Elec'n 66:777-8 Ap 24 '15; Discussion. Am Inst E E Pro 34: 2984-96 D '15

2984-96 D '15 Machines for breaking pig iron, il Iron Tr R 56:1069 My 27 '15 Manufacture of cores. W. J. Reardon. il Metal Ind ns 13:236-9 Je '15 Motor-driven gyratory riddle. il Foundry 43: 379 S '15

Pneumatic drop machine for the foundry. G. S. Evans. il Iron Age 96:674-5 S 23 '15 Pouring systems for gray-iron foundries, il Iron Age 96:1123-5 N 11 '15

See also Casting machines; Charging machines; Molding machines

# Exhibitions

Annual exhibit of foundry equipment, il Iron Age 96:824-6 O 7 '15 Annual exhibition at foundrymen's convention, Atlantic City, Sept. 25 to Oct. 1. Iron Tr R 57:580-3 S 23 '15

Exhibitors and the products displayed, Atlantic City, Sept. 25-Oct. 1. Iron Age 96:694-700 S 23 '15

Exhibitors and what they'll exhibit; Atlantic City, Sept. 25-Oct. 1, 1915. Foundry 43:341-4

S 15 Foundry and machine exhibition, Atlantic City, Sept. 25-Oct. 1. il Foundry 43:398-404 O 15 Foundry and machine exhibition, Atlantic City, Sept. 25-Oct. 1. Metal Ind n s 13:406-9 O 15

Foundry exhibits at Atlantic City, il Iron Tr R 57:639-44 S 30 '15

Foundry management

oundry management
Applying scientific management. H. K. Hathaway. Iron Tr R 57:739-42+, 787-93 O 14-21
'15; Same. Foundry 43:440-4, 502-7+ N-D '15
Automobile foundry core-room economies. il
Iron Age 95:131-3 Ja 14 '15
Commercial problems of the foundry. R: Moldenke. Iron Age 96:707-9 S 23 '15
Congestion in foundries. H. M. Lane. Iron Age
95:999 My 6 '15
Denertmental cooperation in foundry, work:

95:999 My 6 '15
Departmental co-operation in foundry work; how the casting plant can aid the sales department. W: H. Barr. Foundry 43:121-3 Mr '15; Same cond, Iron Age 95:798-9 Ap 8 '15
Efficiency in the brass foundry. W. R. Dean. Metal Ind n s 13:327-9 Ag '15
Eliminating waste motion in molding. R. E. Kennedy and J. C. Pendleton. il Iron Age 94: 662-4 S 17 '14; Same. Ind Eng 14:423-6 N '14
First principles of shop planning. F. M. Perkins. il Foundry 43:366-72 S '15
Ford methods and the Ford shops. H. L. Arnold. il plans Eng M 48:524-50 Ja '15
Foundry use of non-ferrous scrap metals. F. M. Perkins. il Metal Ind n s 13:140-2, 194-7 Ap-My '15

Foundry use of non-ferrous scrap metals. F. M. Perkins, il Metal Ind n s 13:140-2, 194-7 Ap-My '15

How to increase the output of your foundry. G. K. Hooper. Foundry 43:93-5 Mr '15; Same cond. Iron Age 95:352-3 F 11 '15

Important problem of obtaining new work. H. J. McMurtrie. Foundry 43:271-2 Jl '15

Leaves from the diary of a malleable man. L. E. Gilmore. Iron Age 95:32-4 Ja 7 '15

Metamorphosis of the foundry. R. A. Bull. Foundry 43:415-17 O '15

National founders' association 19th annual convention. Iron Age 96:1242-7 N 25 '15

Operating a foundry on a scientific basis: a large Detroit shop specializing in aluminum castings. F: A. Parkhurst. il Foundry 42:443-7, 479-86; 43:21-6; 53-8, 107-10 N '14-Mr '15

Practical follow-up system for the foundry. T. A. St. Clair, jr. Foundry 43:319-21 Ag '15

Principles of continuous melting applied. J. F.

Principles of continuous melting applied. J. F. Ervin. Iron Age 96:686-7 S 23 '15

Promise-keeper for the foundry. R. E. Wood. Foundry 43:227-8 Je '15

Reclaiming brass sweepings. A. W. Lemme. Iron Age 95:946 Ap 29 '15; Same. Foundry 43:191-2 My '15; Same. Metal Ind n s 13:187-8 My '15

Selling price of castings. A. O. Backert. Iron Tr R 56:228-30+ Ja 28 '15 Shop management and what it means. E. W. Wallbank. Foundry 43:299-300 Ag '15

Foundry management —Continued Success and failure in the foundry, A. Kiefer, plan Foundry 43:297-8 Ag '15 Training in foundry work that is worth while; the course at the University of Illinois, R. E. Kennedy and J. H. Hogue, il Foundry 43: 405-11 O '15; Same, Iron Tr R 57:617-23 S 30

Where are the profits in the foundry business?
A. G. Dean. Foundry 43:74-5 F '15
Where's that pattern? and how to locate it.
H. A. Russell. il Foundry 43:263-5 Jl '15

See also Foundries—Safety devices and measures; Foundry practice; Foundry records; Foundry sanitation

Foundry practice

merican foundrymen's association annual convention, Atlantic City. Foundry 43:385-

merican foundrymen's association annual convention, Atlantic City, N. J. Iron Tr R 57:694-701 O 7 '15 American

57:694-701 O 7 '15

American foundrymen's association convention, Atlantic City, Sept. 27-Oct. 1; abstract of papers and discussion. Iron Age 96:814-19, \$22-4 O 7 '15

Applications of cores in modern molding. R. A. Bull. Iron Age 96:784-6 S 30 '15; Same. Iron Tr R 57:785-6+ O 21 '15; Same. Foundry 43: 470-1+ N '15

Are welding and the conditions of the

470-1+ N 15
Arc welding and its application in the metalworking industry, J. F. Lincoln, Elec R & W
Elec'n 66:1161-2 Je 19 '15; Same cond. Foundry 43:139-40 Ap '15; Excerpts, Iron Age 95:
949 Ap 29 '15
Babbitt bearing mold. S. Sucram, diag Mach
21:582 Mr '15

21:582 Mr '15
Buffalo electric steel foundry. H. C. Estep. il
plan Iron Tr R 56:215-20 Ja 28 '15; Same.
Foundry 43:1-6+ Ja '15
Care in in liting Zinc. R. Job and F. F.
White, il Iron Age 96:199 Jl 22 '15
Causes of coke troubles in the foundry. Iron
Age 91:1348-9 J. 10 '11
Common sense-steel foundryman's great asset.

Common sense-steel foundryman's great asset. S. Muntz and S. Roubieu. il Foundry 43:175-8 My '15; Same. Iron Tr R 57:949-52 N 11 '15 Converter foundry of large capacity. E. F. Cone. il plan Iron Age 96:669-74 S 23 '15 Drop-pouring process of casting: the solution of a difficult brass foundry problem. E. A. Barnes. il Metal Ind n s 12:511-12 D '14 Electric furnace in the foundry. J. H. Gray. dlags Iron Age 96:788-800, 878-81 O 7-14 '15 Electric furnace in the foundry. R. C. Gosrow. Met & Chem Eng 13:882-3 D 1 '15 Ford methods and the Ford shops. H. L. Arnold. il plans Eng M 48:524-50 Ja '15 Foundry economies in the Ford motor plant. il diag Iron Age 96:680-3 S 23 '15 Foundry transfer pits. H. M. Lane. Iron Age 95:820-1 Ap 8 '15 Functions of sand binders. H. M. Lane. Metal Ind n s 13:421-3 O '15 Getting the most from molding machines. P. R. Ramp. diags Iron Age 96:10-4 J1 1 '15 Heat losses from an electric furnace. W. H. Wills and A. H. Schuyler, Iron Age 96:1052-3 N 4 '15

How boiler and greenhouse parts are molded. E. C. Kreutzberg, il plan Foundry 43:249-57 Jl '15

How producer gas is used for drying molds and cores and for heating ladles in English foundries. il Foundry 42:229-30 Je '15
How radiator cores are made efficiently. E. C. Kreutzberg. il Foundry 42:471-3 D '14
How sewing mee the are molded and cast. H. C. Estep. il Foundry 43:345-51 S '15
How Stout institute students cast a gasoline engine. F. F. Hillix. il Foundry 43:99-102 Mr '15

How to eliminate defects in steel castings. J: H. Hall. Foundry 43:146-51 Ap '15; Same. Iron Tr R 57:225-9+ Jl 29 '15

How to get high core efficiency. H. M. Lane. Iron Age 96:684-6 S 23 '15

ow to operate the sand-blast efficiently. J. M. Betton. Foundry 43:182-3 My '15 How

Huge flywheel for Ford plant, il Automobile 32:505 Mr 18 '15

Liquid fuel for foundry cupolas. E. F. Cone. diag Iron Age 95:1058-9 My 13 '15

Machine-made cores. W. D. Fraser. il Foun-

dry 43:160 Ap '15
Making car wheels at the Lenoir car works.
G. S. Evans. Foundry 43:351-3, 428-31, 435-9 G. S. E S-N '15

Making cores for an intricate casting. J. L. Sendner, il Foundry 43:143-4 Ap '15 Making sectional molds for die-cast name-plates. E: K. Hammond. il Mach 21:554-7 Mr

'15
Making small gear wheels with a molding machine. R. A. Miles. il diags Foundry 43: 161-2 Ap '15
Molding and casting a bronze monument. W. N. Nelly. il Metal Ind n s 13:93-4 Mr '15
Molding machines and pattern mounting.
J. F. Ervin. Iron Age 95:721-4 Ap 1 '15
Molding the new Cadillac eight-cylinder motor. H. C. Estep. il Foundry 43:171-4 My '15

Oil firing in foundry practice. W. N. Best. Iron Age 95:870-1 Ap 15 '15 Old piston used for a core box. A. F. Albert. diags Mach 21:748 My '15 Opportunities for the foundry engineer; abstracts. W. F. Prince. Foundry 43:63-4 F '15; Iron Age 95:146-8 Ja 14 '15 Packing ingot molds. S. K. Eastwood. diag Iron Age 95:351 F 11 '15 Plaster matches for use on machine or floor. A. Hill, Foundry 43:238-9 Je '15 Precision castings. E. Buckingham. il diags Metal Ind n s 13:11-13 Ja '15 Present-day aspects of English foundry practice. J. Horner. il Metal Ind n s 13:97-8, 146-8 Mr-Ap '15 Reducing the cost of foundry patterns. D. Gor-

Mr-Ap '15
Reducing the cost of foundry patterns. D. Gordon. il diags Iron Age 95:1277-9 Je 10 '15
Sand mixing plant for a large foundry. il Iron
Age 94:1273-5 D 3 '14
Scientific operation of a cupola. D: Townsend.
il diag Iron Tr R 57:133-5 Jl 15 '15; Same.
Foundry 43:322-4 Ag '15; Same. Iron Age 95:
590-1 Mr 11 '15
Steel casting plant at Oakland, Cal. il Iron
Age 95:1387-8 Je 24 '15

What's the matter with the foundries? J. P. Brophy. Mach 22:141 O '15

Would the castings have come straight? W. F. Barrows. Foundry 43:19 Ja '15

See also Aluminum founding; Brass founding; Cast iron; Copper founding; Cupola furnaces; Die casting; Electric furnaces; Electricity in foundries; Foundry machinery; Iron founding; Steel castings

Study and teaching

Teaching foundry practice by mail, il Foundry 43:65-8 F '15

Training embryo foundry leaders in school; outline of the course of Wentworth institute. E. A. Johnson, il Foundry 43:306-10 Ag '15

Training in foundry work that is worth while; the course at the University of Illinois, R. E. Kennedy and J. H. Hogue, il Foundry 43: 405-11 O '15; Same. Iron Tr R 57:617-23 S 30 '15

## Tables, calculations, etc.

Formulas for finding the weights of castings. W. L. Tryon. Foundry 42:8a, 50a, 226a, 336a, 406a, 456a, 484a Ja-F, Je, S-D '14

Weight of rods or cylinders per running inch W. L. Tryon. Foundry 43:16a, 58a Ja-F '1

Foundry records
Where's that pattern? and how to locate it.
H. A. Russell. il Foundry 43:263-5 Jl '15

Foundry sand. See Sand, Foundry

Foundry sanitation
New York state rules governing casting
plants. Foundry 43:295-7 Ag '15; Same. Iron
Tr R 57:312-13+ Ag 12 '15 See also Foundries-Ventilation

Foundry standards
Standard specifications for the foundryman.
Foundry 43:258-61 Jl '15

Foundry symbols
Operating a foundry on a scientific basis. F: A.
Parkhurst. il Foundry 42:479-86 D '14
Pattern storage systems for factories. J: G.
Shirley. Iron Age 96:304-6 Ag 5 '15

Foundrymen's association, American. See Ameri-

Fountains

Tesla's fountain, il Sci Am 112:162 F 13 '15

See also Drinking fountains; Springs

Fraction calculator. See Calculating machines

Fractions, Continued

Use of continued fractions in mechanical problems, W: W. Johnson, il diag Mach 21:802-4

Je 15

Fractures

Device for treatment of dislocated and fractured lower limbs. il Sci Am 113:364+ O 23

Quick mending of broken bones. Sci Am S 78:

Framing (building)

raming (building)
Design and construction of the 435-ft. steel
framed tower of jewels at the Panama-Pacific international exposition. F. S. M. Harris,
il diags Eng & Contr 43:47-54 Ja 20 '15;
Same cond. Eng N 73:866-72 My 6 '15
Exterior wooden framing of the tower of
jewels, Panama-Pacific international exposition. plans Eng & Contr 43:377-9 Ap 28 '15

France

## Commerce

Commercial organizations in France, A. J. Wolfe, U S Bur For & Dom Com 98:1-75 '15

## Commercial policy

Government institutions for promotion of commerce, A. J. Wolfe, U.S. Bur For & Dom Com 98:57-75 '15

## Industries and resources

French automobile industry in good condition, il Automobile 32:101-2 Ja 21 '15
French steel plants in war time, F. Miltoun, Iron Age 95:940-2 Ap 29 '15
Iron and steel industry of northern France, L. De Launay, Eng M 49:735 Ag '15
Manufacture of chicory, J. Boyer, il Sci Am\* 8 80:40-2 Jl 17 '15

Commercial laws of England, Scotland, Germany and France, A. J. Wolfe and E. M. Borchard, U.S. Bur For & Dom Com 97:69-106 '15

## Social conditions

Housing reform in France, C. Aronovici, Am Inst Arch J 3:32-6 Ja '15

Franchises

Franchise value. Elec R & W Elec'n 65·1180-2 D 19 '14

New Jersey decision. H. S. Welsh. Elec Ry J 45:57 Ja 2 '15

Valuation of franchises. Elec Ry J 44:1331-3 D 19 '14

See also Electric service companies—Franchises; Municipal franchises; Public service corporations—Franchises; Street railroads— Franchises

Franklin, Benjamin, 1706-1790 Stove trade to honor Benjamin Franklin. il Metal Work 84:88-9 Jl 16 '15

Fraternity houses
Phi Gamma Delta fraternity house, Philadelphia, Pa.; views and plans. Brickb 24:77, pl 40-3 Mr '15

Fraud

Machine greengoods game. Mach 21:288 D '14 Safeguarding the company's bank account. E. J. Buckley. Metal Work 83:939 Je 25 '15 See also Competition, Unfair; Forgery

Free energy Free energy of formation of formic acid. G. E. K. Branch. diags Am Chem Soc J 37:2316-26 K. Bi O '15

Free energy of iodine compounds. G. N. Lewis and M. Randall. Am Chem Soc J 36:2259-68 N '14

Free energy of nitrogen compounds, G. N. Lewis and E. Q. Adams, Am Chem Soc J 37:2308-16 O '15

Free energy of oxygen, hydrogen, and the oxides of hydrogen. G. N. Lewis and M. Randall. Am Chem Soc J 36:1969-93 O '14 Free energy of the various forms of elementary sulfur. G. N. Lewis and M. Am Chem Soc J 36:2468-75 D '14

Free radicals. See Radicals (chemistry) Freedom of the seas. See Maritime law

Freezing

Why ice, in refrigerators, prevents freezing. J: D. Bonnar. Sci Am 112:249 Mr 13 '15 Sec also Ice; Refrigeration and refriger-ating machinery

Freezing points

Freezing points

A. La Motte. Colliery 35:317 Ja '15

Measurement of the freezing-point depression of dilute solutions. L. H. Adams. diags Am Chem Soc J 37:481-96 Mr '15

Freezing tests

Laboratory freezing tests. H. Perrine. diags Concrete Cem 5:256-7 D '14

Freight National industrial traffic league annual meet-ing, Nov. 17-18. Ry Age 59:1004 N 26 '15

See also Demurrage; Electric railroads— Freight; Freight car service; Freight cars; Freight handling; Freight ships; Railroads— Freight; Railroads—Rates

Freight agents. See Railroads-Freight agents Freight car service

reight car service
Car pooling arrangement on International &
Great Northern and Sunset-Central lines. Ry
Age 58:95 Ja 15 '15
Car service and the shipper. F. C. Maegly. Ry
R 57:217-19 Ag 14 '15; Same cond. Ry Age
(Mech ed) 89:293-4 Je '15
Car surpluses and shortages. Ry Age 59:490-1
S 17 '15

Carriers must furnish tank cars. Ry R 56:855-6

Carriers must furnish tank cars. Ry R 56:855-6
Je 19 '15 Le 19 '15 Le 19 '16 Le 19 '16 Le 19 '16 Le 19 '17 Le 19 '17 Le 19 Le

F. P. Farr. Ity Age 58:155-15 Mr 12 15.

Ways and means of expediting movement of cars loaded with preferred freight; abstract.

M. J. O'Connor. Ry Age (Mech ed) 89:516 O

See also Demurrage; Freight cars, Inter-change of Car load

Heavier loading of cars. Ry Age 57:1033-4 D

Improper loading of box cars. W. H. Sitterly. Ry Age (Mech ed) 89:233-4 My '15

Box car end door. G: E. McCoy. diags Ry Age (Mech ed) 89:173 Ap '15 Box car flush door. plan Ry R 57:185-6 Ag 7 Freight cars

British-built hopper cars for the Bengal-Nag pur Ry, F. C. Coleman, il Ry R 57:432-3 ( 2 '15

Canadian built cars for the Belgian state railways. diag Ry R 57:441 O 2 '15

Freight cars-Continued

Car service and the shipper. F. C. Maegly. Ry R 57:217-19 Ag 14 '15; Same cond. Ry Age (Mech ed) 89:293-4 Je '15 Cars and locomotives ordered in 1914. Ry R 56:

36-9 Ja 2 '15 Defective box

Defective box cars. C. L. Bundy. Ry Age (Mech ed) 89:80 F '15
Defective box cars. L. Brown. Ry Age (Mech ed) 89:30 Ja '15
Defects of modern box cars and their remedies. R. N. Miller. Ry Age (Mech ed) 89:171-3 Ap '15
End construction of Canadian Pacific stock cars, diags Ry Age (Mech ed) 89:29-30 Ja '15
Experiments to Adv.

'15
Experiments to determine the forces imposed on a truck side frame and the stresses produced. L. E. Endsley. il diags Ry R 56: 460-3, 494-7 Ap 3-10 '15; Same cond. Ry Age (Mech ed) 89:127-9 Mr '15
Freight car hand brake. diags Ry Age 58:944
Ap 30 '15; Same. Ry Age (Mech ed) 89:2589 My '15
Freight can statistics as compiled by the Amera-

Freight car statistics as compiled by the American railway association. Ry R 56:53-4 Ja

Freight car stenciling outfit. H. F. Blossom. diag Ry Age (Mech ed) 89:458 S '15
Freight cars ordered in 1914, Ry Age 58:16-17 Ja 1 '15
Freight equipment cars for the Russian government. il diags Ry R 57:419-22 O 2 '15
Freight terminal car checking system. I. T. Tyson. ky Age 58:718-9 Ap 2 '15
Greatest weaknesses in box cars. R. P. Blake, Ry Age (Mech ed) 88:630-1 D '14
Impact between freight cars in switching service. L. E. Endsley, il Ry R 57:10-13 Jl 3 '15; Abstract, Elec Ry J 45:1164 Je 19 '15
Manual slack adjuster, diags Ry Age 59:948
N 19 '15
No greatest defect in box cars. C: E. Wood.

N 19 '15
No greatest defect in box cars. C: E. Wood.
Ry Age (Mech ed) 89:20 Ja '15
Proposed design of standard M. C. B. box cars.
plans Ry R 57:6-9 Jl 3 '15
Recent additions to Union Pacific freight
equipment. il diags Ry Age 58:225-9 F 5 '15
Roof structures for box cars. Ry R 56:
459-60 Ap 3 '15
Standard box car—a negative viewpoint.
B. W. Burnett Ry Age 58:403.4 Mr 5 '15:

Standard box car—a negative viewpoint. R. W. Burnett. Ry Age 58;403-4 Mr 5 '15; Same. Ry Age (Mech ed) 89:121-2 Mr '15 Standardizing car construction. Ry R 56:889 Je

Steel frame box cars for the Illinois Central, il diags Ry Age (Mech ed) 89:78-80 F '15 Strengthening of underframes. Ry Age (Mech ed) 89:498 O '15 Canadian Register

Thirty-ton stock car for the Canadian Pacific Ry. R. W. Burnett. il diag Ry R 55:686-7 D Ry. 1

b 14 Wooden cars in freight trains. Ry Age (Mech ed) 88:631-2 D 14 Wooden cars in freight trains. G. E. Smart. Ry Age (Mech ed) 88:581-2 N 14; Same. Ry R 55:695-6 D 5 14

See also Baggage and express cars; Brake-beams; Freight car service; Loading and unloading; Refrigerator cars; Tank cars; Train resistance

Settlement prices for reinforced wooden cars; Master car builders' association committee report. Ry R 56:836-7 Je 19 '15

# Cost of maintenance

ost of maintenance of equipment: a record of the Waugh draft gear. Ry R 56:66-7 Ja 9

Record of cost of maintaining car draft appliances. Ry R 56:294 F 27 '15

## Repair

Repair

Economies in freight car repairs. H. H. Harvey. Ry R 56:312-13 Mr 6 '15; Same. Ry Age (Mech ed) 89: 29 30 Mr '15.

Freight car rehabilitation, Southern railway. diags Ry R 57:576-8 N 6 '15

Freight car repairs under a piece work system. J. J. Tolin. Ry Age (Mech ed) 89:347-8 Jl '15

Inspection and repairs of freight cars by piecework. J. J. Tolin. Ry Age (Mech ed) 89:457-8 S '15

Promoting the proper handling of equipment. E. E. Betts. Ry R 57:497-500 O 16 '15 Promoting the proper handling of equipment. W. H. Crawford. Ry R 57:563-4 O 30 '15 Proposed bureau for clearing car repair accounts. C. F. Straub. Ry Age 59:161-2 J1 23 '15

See also Railroads-Shops

### Weighing

Reweighing and restenciling of cars. J. V. James, Ry Age 58:1128-9 My 28 '15

James, Ry Age 58:1128-9 My 28 '15

Freight cars, Interchange of
Chief interchange car inspectors' and car
foremen's association 17th annual convention. Ry Age (Mech ed) 89:522-5 O '15

Interchange of cars. H. Boutet. Ry Age (Mech
ed) 88:623-4 D '14

Promoting the proper handling of equipment.
E. E. Betts. Ry R 57:497-500 O 16 '15

Promoting the proper handling of equipment.
W. H. Crawford. Ry R 57:563-4 O 30 '15

Freight cars, Steel

Bettendorf all-steel box car. il Ry R 56:801 Je

Narrow-gage cars for the Burma mines Ry. F. C. Coleman, il plans Ry R 57:173-5 Ag 7

Recent additions to Union Pacific freight equipment, il diags Ry Age 58:225-6 F 5 '15 Steel box car for the Canadian Pacific, il diags Ry Age 58:1420-2 Je 18 '15; Same, Ry Age (Mech ed) 89:399-401 Ag '15

(Mech ed) 89:399-401 Ag '15 Steel gondolas for the Russian government, il Ry Age 59:898-9 N 12 '15 Union Pacific steel freight cars, il diags Ry Age (Mech ed) 89:73-7 F '15 Well car of 200,000 lb, capacity, il diags Ry Age (Mech ed) 89:397-8 Ag '15

Freight claim association 24th annual meeting, Chicago, June 16-18. Ry Age 59:98 Jl 16 '15

Freight claims. See Railroads-Claims

Freight handling

reight handing
Car dumping machine with improved features
at Conneaut Harbor, Ohio. il plan Ry Age
59:390-2 Ag 27 '15
Congestion of freight at New York piers. il
Int Marine Eng 20:80 F '15
Cost data for electric trucks in freight

Int Marine Eng 20:80 F '15
Cost data for electric trucks in freight houses. Eng Rec 71:403 Mr 27 '15
Economy gained by handling freight with electric trucks at marine terminals. il Int Marine Eng 20:124-5 Mr '15
Facilities for shipping and freight handling at river ports. E. E. R. Tratman. Int Marine Eng 20:115 Mr '15
Freight handling at Havana, Cuba. il Int Marine Eng 20:116-18 Mr '15
Freight handling at railway marine terminals. C. A. Hardy. diag Int Marine Eng 20:103
Mr '15
Handling freight with story of the control of the

Mr '15
Handling freight with storage battery trucks.
il Ry Age 57:1093-4 D 11 '14
Handling of freight in terminals. R. H.
Rogers. Am Inst E E Pro 34:3048-52 D '15
How the operation of one local freight station was improved. C. B. Anderson, Ry Age
59:1065-7 N 26 '15
Important principles in the handling of

59:1005-7 N 26 '15
Important principles in the handling of l.c.l. freight. C. G. Johnson. Ry Age 59: 1007-9 N 26 '15
Marine Eng 20:109-11 Mr '15
Mercury freight house tractor truck. il Ry Age 58:361-2 F 26 '15
Methods of handling L. C. L. outbound freight. E. H. Lee. Ry Age 57:1181-4 D 25 '14; Conclusions. Eng Rec 71:52 Ja 9 '15
New marine terminals at Beaumont. H. M. Harding. plan Eng N 73:1072-3 Je 3 '15; Same. Int Marine Eng 20:299-300 Ji '15; Same cond. Eng Rec 71:721 Je 5 '15
New York freight terminals, 1914. Ry Age 59: 395-7 Ag 27 '15
Points of attack in the terminal problem. J. A. Jackson. il Int Marine Eng 20:111-13
Mr '15
Possibilities open to the central station in

Possibilities open to the central station in solving the freight terminal problem, J. A. Jackson, Gen Elec R 18:1142-4 D '15

Reservoir effects in freight movements, R Rogers, il Int Marine Eng 20:107-9 Mr R. H. Ir '15

Freight handling—Continued
Transfer facilities at marine terminals, H. M.
Harding, il Int Marine Eng 20:98-102 Mr

Trucking l. c. l. freight. Ry R 56:352-3 Mr

Unloading bananas by machinery, il Sci Am S 79:209 Ap 3 '15 Unloading cargoes by portable machines, il Int Marine Eng 20:105-6 Mr '15

See also Coal handling; Elevators, Inclined; Freight houses; Hoisting machinery; Loading and unloading; Lumber handling; Ore handling; Railroads—Terminals; Ter-

minals Freight houses

Design and construction features of the Ocean steamship co.'s terminal at Savannah, Ga. il plans Eng & Contr 44:343-4 N 3 '15 Important principles in the handling of l.c.l. freight, C. G. Johnson, Ry Age 59:1007-9 N

26 15
Pittsburgh North side freight station of the P. R. R. H. M. Phelps. il plans Ry Age 59: 245-6 Ag 6 '15
Ratproof freight house of the Panama railroad. diag Ry R 56:159 Ja 30 '15

Freight rates

Development of inland water transportation. J: H. Bernhard. Eng Rec 72:332-4 S 11 '15 Sce also Railroads-Rates

Freight ships

Average draft of ocean vessels. Eng N 73:738 Ap 15 '15

Conversion of cargo vessels into bulk oil carriers. F. K. Ruprecht. Int Marine Eng 20: 165-6, 212-16, 258-9, 309-11, 340-3, 404-6 Ap-S

Freight carrying on the Great Lakes. D. A. Willey, il Sci Am S 79:360 Je 5 '15 Freight steamer Nevada, plans Int Marine Eng 20:347-8 Ag '15 Fruit carrying steamer van Hogendorp, F: C. Coleman, il diag plans Int Marine Eng 20: 67-71 F '15

Coleman, il diag plans Int Marine Eng 20: 67-71 F '15 Influence of discharging appliances on the design of large ore carriers. J: Reid, diag Engineer 119:300-1 Mr 26 '15 Lumber operations on the Atlantic coast; modern lumber steamer and complete terminals under construction for shipping lumber from Florida to New York, diags Int Marine Eng 20:126-8 Mr '15 Repairs to lake freighter H. M. Hanna, Jr. il Int Marine Eng 19:554-6 D '14 Self-unloading freight steamer Huron, il diags Int Marine Eng 20:52-8 F '15 Steamer Francis Hanify, il diag plans Int Marine Eng 20:30-2 Ja '15 Steamship Edward Peirce, plans Int Marine Eng 19:559-60 D '14 See also Tank ships

See also Tank ships

Freight stations. See Railroads-Stations

Freight terminals, See Freight handling; Rail-roads—Terminals; Railroads—Yards; Terminals

Freight trains. See Railroads-Trains

Frequency changers
Parallel operation of frequency changers. G. H.
Rettew. diag Gen Elec R 18:836-8 Ag '15

Friction

Allowable friction values; effect of the speed of rotation on the operation of a friction clutch. B. D. Pinkney. Mach 21:793-4 Je '15 Cutting down friction waste. J. C. Taylor. Power 42:488 O 5 '15

Cylinder friction and lubrication testing apparatus. A. Flowers, diag Power 42:208-10 Ag 10 '15

Friction drive. C. W. Larson. Am Inst E E Pro 34:2674-6 N '15

Friction losses in the universal joint; abstracts, P. F. Walker and W. J. Malcolmson, Iron Age 94:1438-9 D 24 '14; Am Soc M E J 37: 17-20 Ja '15

How to reduce machine friction. N. G. Near. Metal Ind n s 13:409 O '15

Recent tests of the effective force between driving belt and pulleys; abstract. A, Fried-rich. Am Soc M E J 27:554-5 S '15

Tests of frictional resistance of concrete on shale, E. L. Lasier, il diag Eng N 74:156-8 Jl 22 '15

Theory of lubrication, L. Ubbelohde, Gen Elec R 18:966-72, 1074-81, 1118-21 O-D '15 Theory of resistance to rolling of a hard body over a plastic surface; abstract, B. B. Schultz, Am Soc M E J 37:478-9, 555-8 Ag-S

See also Bearings; Lubrication and lubricants

Frost

rost 16 feet deep found under refrigerator plant. J. N. Jensen, il Eng Rec 72:297 S 4 '15

Frost protection
Self-lighting attachment for smudge pots.
C: A. Byers, il Sci Am 113:445 N 20 '15

Frosted fruit. See Fruit, Frosted

Fructose pentacetate
Crystalline d-fructose pentacetate, C. S. Hudson and D. H. Brauns, Am Chem Soc J 37: 1283-5 My '15

Fruit

Pre-cooling of Canadian fruits, E. Smith. Am Soc M E J 37:199-1 Mr '15

See also Cannon ball tree; Osage orange; Tamarinds

Fruit, Frosted Sorting out frosted oranges and lemons. S. McKinstry, il Sci Am 111:512 D 19'14

Fruit juices Studies on fruit juices. H. C. Gore. U S Agric Rul 241:1-19 '15

uel
Boiler plant of the Bessemer coal and coke company; using as fuel a mixture of coal and slate. W. O. Rogers. il diags plan Power 41: 798-801 Je 15 '15
CO<sub>2</sub> and the character of fuel. T. H. Reardon. Power 41:574 Ap 27 '15
Chart of relative values of fuels. R: A. Rover. Power 42:441 S 28 '15; Same. Eng & Min J 100:600 O 9 '15
Coal substitutes: use of chalk fuel and peat

Coal substitutes; use of chalk fuel and peat proposed in England, Sci Am S 79:352 My

29 '15
Comparison of the economy of powdered coal, oil and water gas for heating furnaces. C. F. Herington. Eng N 72:1156-8 D 10 '14
Firing low-grade fuel and wastes. S. H. Bunnell. Power 41:378 Mr 16 '15
Fuel values of coal gas and oil; operators of plants in Oklahoma compare costs on evaporation-unit basis. Elec W 65:1470 Je 5 '15
Fuel values of coal, oil and gas. E. H. Hunter; L. G. Purtee. Elec Ry J 45:984 My 22 '15

Future methods of utilizing coal. C. F. Hirshfeld. Power 41:488-9 Ap 6 '15; Same. Sci Am S 80:58-9 Jl 24 '15

Gas producers and concentration of power at mines. R. H. Fernald, Colliery 35:415-17 Mr

How much CO<sub>2</sub> to expect with various kinds of fuel. V: J. Azbe. Power 42:712-14 N 23 '15

Making fuel out of garbage. W. D. Hornaday. il Munic Eng 48:304-5 My '15

Saving fuel in heating a house. L. P. Breck-enridge and S. B. Flagg. U S Bur Mines Tech Pa 97:1-33 '15; Same cond. (Firing various fuels in residence heaters) Metal Work 84:552-4, 584-6, 613-15 O 29-N 12 '15

Steam generation in a wood-distilling plant. L. Eddy. diag Power 41:846 Je 22 '15

World's supply of fuel and motive power. D. Clerk. Engineer 120:425-6 N 5 '15

See also Alcohol as fuel; Automobile engines—Fuel; Blast furnace gas; Briquets; Calorimeters and calorimetry; Cinders; Coal; Coke; Furnaces; Gas, Natural; Gas and oil engines—Fuel; Gas as fuel; Heating; Lignite; Locomotives—Fuel; Peat; Petroleum as fuel; Smoke; Tar as fuel; Waste fuel; Wood as fuel

## Cost

Comparative furnace efficiency. R. J. Weit-laner. Met & Chem Eng 13:357-61 Je '15 Furnace curves. R. J. Weitlaner. Met & Chem Eng 13:428 Jl '15

Fuel

## Testing

Evaporation tests with peat and peat coke as fuels. H. Winkelmann. Am Soc M E J 37: 289 My '15

289 My 15 Fuel-supply contracts and the progress of more scientific methods of purchase and control in America and Europe, J. B. C. Kershaw, Met & Chem Eng 13:398-6 Je '15

Fuel economizers

uel economizers
Counter-current principle as applied to directly-fired and to waste-heat boilers: abstract,
G: H. Gibson. Am Soc M E J 37:53-5 Ja. '15
Economizers in modern high-pressure power
plants. G. C. Usher, Power 42:520 O 12 '15
Economizers in modern high-pressure power
plants. N. G. Reinicker, Power 42:655-6 N 9
'15

Fisk street station, Chicago, economizers, T. Wilson, diags Power 42:477-8 O 5 '15
Fuel economy increased 12 per cent with economizers. Elec W 65:1634 Je 19 '15
Hartford economizer for Ford cars. il Horseless Age 34:911-12 D 23 '14
Notes on economizer operation, Locomotive 30: 112-14 O '14

Fuel economy

Analysis of dependent sequence as a guide to
fuel economy. H. Emerson. Ry R 57:19-23 Jl
3 '15; Same cond. Ry Age 58:1057-9 My 21
'15; Same cond. Ry Age (Mech ed) 89:273-4
Je '15

Cool and its economical use. P. S. Thompson.

Je '15 Coal and its economical use. P. S. Thompson. Inst E E J 53:184-7 Ja 15 '15; 'Abstract. Elec W 65:422-3 F 13 '15; Discussion. Inst E E J 53:187-90 Ja 15 '15 Coal, the big item in a steam power plant. Power 41:165 F 2 '15; Same. Sci Am S 79: 125 F 20 '15

125 F 20 '15

Economic utilisation of coal and the production of cheap power. W. F. Reid. Engineer 120:92 J1 23 '15

Efforts at fuel economy, Rock Island lines. W. J. Tollerton. Ry R 57:354-5 S 18 '15

Experiments in coal consumption. Int Marine Eng 20:41-2 Ja '15

Fuel economy and the proper utilisation of coal. W. A. Bone. Engineer 120:357-8 O 15 '15

'15
Fuel economy on locomotives. diag Ry R 57:
181-5 Ag 7 '15
Fuel economy on the Great Western. il Ry
Age 58:195-7 Ja 29 '15
Full train: tonnage and fuel economy. Ry R
56:815 Je 12 '15
Furnace curves. R. J. Weitlaner. Met & Chem
Eng 13:425-8 Jl '15
Loss of combustible in ashes. Power 42:683-4
N 16 '15
Manila plant employees receive bonus for in-

N 16 '15

Manila plant employees receive bonus for increasing coal economy. Elec W 66:694 S 25 '15

Preventing losses in factory power plants.
S. J. H. White. Iron Age 95:778-9 Ap 8 '15;

Excerpts (How daily records save the coal;
How a 25 per cent. saving was made). Sci
Am S 80:16, 19 Jl 3-10 '15

Reducing the fuel expense. J. F. Springer. il
Am Ind 15:28-30 My '15

Saving coal. C: Maier. Ry Age (Mech ed) 89:
442 S '15

U-tube carbon dioxide indicator. E. A. Cunningham. il diag Iron Age 96:870-2 O 14 '15

See also Fuel economizers; Grates; Locomotives—Fuel

Fuel stations. See Coaling stations

Fuel testing

Wood and coal as fuel for steam boilers. H. B. Reynolds. tables Sibley J 30:14-20 O '15

Full crew law. See Railroad law

Fullagar engine
New type of internal combustion engine: abstract. H. F. Fullagar, diags Am Soc M E J 37:127-8 F '15

Fulling Difficulty in fulling overcome. Textile World 49:462-3 JI '15
Fulling mill wrinkles and streaks. Textile World 50:115-16 O '15

Fulton (submarine tender)
Submarine tender Fulton: Diesel engines installed. il diag Int Marine Eng 19:285-7 Jl

Trials of the submarine tender Fulton: first United States naval vessel to be fitted with Diesel engines. il Int Marine Eng 20:76-8 F

Funnels

Pattern for irregular shaped copper funnel. diags Metal Work 84:6+ Jl 2 '15

Furka railway

Furka railway; a new Alpine railway from the Rhône to the Rhine. A. Gradenwitz. il Sci Am S 79:344-5 My 29 '15

Furnace industry

urnace industry

Heading off complaints from furnace users.

Metal Work 83:125-6 Ja 15 '15

Helping furnace dealers help themselves. Metal Work 83:11 Ja 1 '15

How to sell warm air furnaces at a profit.

H. D. Campbell. Metal Work 83:43 Ja 1 '15

National warm air heating and ventilating association discuss warm air heating in convention. Metal Work 83:335-6 F 26 '15

Producers give assistance to distributors. Metal Work 83:37-8 Ja 1 '15

Warm-air furnace and the public. W. Wimmer.

Metal Work 83:257 F 12 '15

Furnace lining Cement as furnace lining. H. L. Strong.

Concrete as a furnace lining, J. C. Hawkins. Power 41:169-70 F 2 '15 Concrete not suitable for furnace linings. A. W. Uhl. Power 42:453-4 S 28 '15 Dolomite and slag furnace lining. Eng & Min J 100:885 N 27 '15 Repairing furnace linings with compressed-air gun and torch. A. Schwarz. Met & Chem Eng 13:582-3 S 15 '15

Furnace pipes. See Furnaces, Hot air-Pipes and fittings

Furnace shields

Tapping shield at Anaconda. il Eng & Min J 99:494 Mr 13 '15 Water-cooled equipment for sheet mills. 1l diags Iron Age 95:441-3 F 25 '15

diraces Air-cooled furnace arches increase efficiency, diags Elec W 65:1186 My 8 '15
Air excess in boiler furnace practice. D. F. Nisbet. Sibley J 29:122-8 Ja '15
Automatically maintaining constant ratio between air and coal supplied to furnaces, il diag Elec W 65:104 Ja 9 '15
Bearing-habbiting furnace J. C. Donovan il

diag Elec W 65:104 Ja 9 '15
Bearing-babbitting furnace. J. C. Donovan. il
Elec Ry J 46:153 Jl 24 '15
Chain screen doors for oven and furnace openings. il Sci Am 113:233+ S 11 '15; Met &
Chem Eng 13:875-6 N 15 '15
Characteristics of firebrick for boiler furnaces, E. H. Tenney. diags Elec W 66:1086-7

naces, E N 13 '15

Corrugated orrugated furnaces for vertical fire-tube boilers. F. W. Dean. diag Power 42:103 Jl

bollers. F. W. Dean, diag Power 42:103 Ji
Factors governing the combustion of coal in
boiler furnaces; a preliminary report. J. K.
Clement, J. C. W. Frazer and C. E. Augustine, il diags US Bur Mines Tech Pa 63:1-41
'14; Excerpts. Sci Am S 79:359 Je 5 '15
Firebrick for boiler furnaces. A. D. Williams.
Power 41:297-8 Mr 2 '15; Same cond. Ind
Eng 15:107-8 S '15
Firebrick for boiler settings. W: A. Heisel.
Power 41:883-7 Je 29 '15
Fusibility of coal ash in various atmospheres.
A. C. Fieldner and A. E. Hall. diags J Ind
& Eng Chem 7:402-6 My '15
Gas explosions in boiler furnaces. diags Power
41:553-4, 651-3, 719, 785-6 Ap 20, My 11, 25,
Je 8 '15
Gas furnace for heating soldering irons. R. H.
Parsons. plan Elec Ry J 46:24 Jl 3 '15
How smokeless combustion is secured by the
Boston Edison company. Il diag Elec W 66:
469 Ag 28 '15
Industrial uses of gas. H. M. Thornton. il Am

Industrial uses of gas. H. M. Thornton. il Am Gas Light J 103:17-22 Jl 12 '15

Lyne furnace water arch. diags Power 42:677 N 16 '15 Metallurgical and special furnaces. Onett. diags Power 41:432-3 Mr 30 '15

Morrow furnace system. diag Power 41:425 Mr 30 '15

Furnaces

urnaces Continued Nicholson furnace, il diag Power 40:848 D 15

Results of changes in boiler furnace. M. B. Smith. diag Power 41:92-3 Ja 19 '15
Return-tubular boiler furnace development. O. Monnett. diags Power 40:93-4 Jl 21 '14;
Same. Sci Am S 78:334-5 D 19 '14
Staying a furnace arch. J. C. Hawkins. diag Power 41:600 My 4 '15
Thermal insulation of high-temperature equipment. P. A. Boeck. diags Am Inst Min E Bul 104:1539-50 Ag '15; Excerpts. Iron Age 96:353-4 Ag 12 '15; Discussion. Am Inst Min E Bul 103:2513-19 D '15
Typical industrial appliances. il Am Gas Light J 103:85-7, 90-3 Ag 9 '15
Use of corrugated furnaces for vertical fire

Typical industrial appliances. If Am Gas Light J 103:85-7, 90-3 Ag 9 '15

Use of corrugated furnaces for vertical fire tube boilers; with discussion. F. W. Dean. diag Am Soc M E J 37:445-6 Ag '15

Wiegand chain screen door. il Int Marine Eng 20:233-4 My '15; Power 42:81 Jl 20 '15

Sce also Blast furnaces; Boilers; Charging machines; Clinkers; Cupola furnaces; Electric furnaces; Fire pots; Firing; Foundry practice; Fuel; Fuel economy; Furnaces, Metallurgical; Grates; Kilns; Mechanical draft; Metallurgy; Smelting

#### Repair

Cement-gun furnace repairs. Eng & Min J 99: 866 My 15 '15

Furnaces, Electric. See Electric furnaces

Furnaces, Hot air Efficiency ratings for warm air furnaces. A. C. Willard, il diags Metal Work 83:932-5 Je 25

Evolution of warm air furnace construction. Metal Work 83:217-18 F 5 '15
Frame building heated by warm air system. M. H. Ressler, il plans Metal Work 84:400-1
S 24 '15

M. 11. Nessel. It plans Metal Work 81.400-1 S 24 '15

Furnaces fail because poorly installed. Metal Work 83:410 Mr 19 '15

Heating a cottage by warm air furnace. plans Metal Work 83:160 Ja 22 '15

Heating a suburban house by furnace. il diags plans Bldg Age 37:19-26 Mr '15

Humidity control of warm air furnaces. C: E. Stewart. diag Metal Work 83:80 Ja 1 '15

"New idea" pipeless furnace. il Metal Work 81:271 Ag 27 '15

Regulating warm air furnace practice; tentative recommendations for a standard of procedure. Metal Work 83:646-8 Ap 30 '15

Return flue warm-air furnace. diag Metal Work 83:271 F 12 '15

Rudy warm-air furnaces. il Metal Work 84:626 N 12 '15

Size of fire pot. Metal Work 84:620-1 N 12 '15

Size of fire pot. Metal Work 84:620-1 N 12 '15 Theory and practice in warm-air heating. Metal Work 83:661+; 84:109-10 My 7, Jl 23 '15

23 '15
Warm air furnace design and installation.
diags Metal Work 83:352-3, 375-6, 477-8, 50911, 569-70, 640-1+, 813-14; 84:1-2, 80-1, 149-50,
367-8, 525-6, 575-6 Mr 5-12, 26-Ap 2, 16, 30,
Je 4, Jl 2, 16, 30, S 17, O 22, N 5 '15
Warm air furnace fails to heat residence.
W. H. James. plan Metal Work 84:281-2 Ag
97 '15

W. H 27 '15

27 '15
Warm air furnace in trying location. il plans
Metal Work 83:327-30 F 26 '15
Warm-air furnace practice. Metal Work 84:
536 O 22 '15
Warm air furnaces use coal, wood and oil
fuel, il Metal Work 83:411 Mr 19 '15
Warm air heating association's convention.
Metal Work 83:899-901 Je 18 '15

Pipes and fittings

Pipes and fittings

Determining correct sizes of furnace pipes.
diag Metal Work 82:821-2 D 25 '14

Modern practice of recirculating air effects
economy and makes satisfied customers.
G. D. Crain, jr. Metal Work 82:769 D 11 '14

Practical hints for furnace erectors. diags
Metal Work 82:819-20 D 25 '14

Practical side of furnace installation. Metal
Work 84:111 J 123 '15

Reducing the fuel bill by saving the heat
waste. Metal Work 83:356 Mr 5 '15

Rules for warm-air furnace installation, Metal
Work 84:488-91 O 15 '15

Simple chart for designing furnace elbows. Metal Work \$4:210-11 Ag 13 '15 Simplified pattern for a Y fitting, diags Metal Work \$3:258 F 12 '15 Simplified pattern for metal center boot, W: Neubecker, diags Metal Work \$4:669+ N 26 '15

Theory and practice in warm-air heating, diags Metal Work 84:310-11, 329+, 558-9 S 3-10, O 29 '15

Trunk-line system heats Michigan bungalow, il plans Metal Work 84:436-7 O 1 '15

Warm air fornace assign and table bliomediags Metal Work 83:352-3, 375-6, 813-14; 84:1-2, 80-1, 525-6, 575-6 Mr 5-12, Je 4, Jl 2, 16, O 22, N 5 '15

Warm-air trunk line system for residence, il plans Metal Work 84:647-8 N 19 '15

Warming and circulating air in residence, diags plan Metal Work 83:255-6 F 12 '15

Why furnace failed to heat bed room, plans Metal Work 83:291 F 19 '15

urnaces, Metallurgical

Metal Work 83:291 F 19 '15

Furnaces, Metallurgical
Annealing oven for tires. W. E. Grum-Grzimailo. diags Iron Age 94:1397 D 17 '14

Areagrams of open-hearth furnace flues. A. R. Mitchell. Iron Age 95:607-8 Mr 18 '15

Bellevue heat-treating furnaces. il Iron Age 96:1171-2 N 18 '15

Carborundum and cork exhibits at the Panama-Pacific international exposition. il Met & Chem Eng 13:458-60 Jl '15

Case-hardening retorts and furnaces. R. A. Millholland. il Iron Age 96:1111-14 N 11 '15

Coal-dust fired reverberatories at Washoe reduction works. L: V. Bender. Am Inst Min E Bul 97:73-81 Ja '15; Abstract. Am Soc M E J 37:188-9 Mr '15; Abstract. Met & Chem Eng 13:184 Mr '15

Coal-dust fired reverberatory furnaces; discussional discussions of the H. Browne, L: V. Browne, L

E J 37:188-9 Mr '15; Abstract. Met & Chem Eng 13:184 Mr '15
Coal-dust fired reverberatory furnaces; discussion of the papers of D: H. Browne, L: V. Bender and R. E. H. Pomeroy. Am Inst Min E Bul 101:1174-86 My '15
Coal-dust fired reverberatory furnaces of Canadian copper co. D: H. Browne, diags Am Inst Min E Bul 97:49-60 Ja '15; Same cond. Met & Chem Eng 13:1382-4 Mr '15; Abstract. Am Soc M E J 37:187 Mr '15
Comparative furnace efficiency. R. J. Weitlaner, Met & Chem Eng 13:357-61 Je '15
Continuous rotary heat-treating furnace. F. M. Paull. il Iron Age 96:569 S 9 '15; Same. Horseless Age 36:234 S 1 '15; Same. Sci Am 113:363 O 23 '15
Description of nut, bolt and rivet shop of Upson nut co. with details of arrangement and equipment. R. V. Sawhill. il plan Iron Tr R 56:1249-51 Je 17 '15
English continuous billet furnace, il diags Iron Tr R 57:841-2 O 28 '15
English gas-fired melting furnaces. diag Am Gas Light J 102:140 Mr 1 '15
Feeding reverberatory furnaces along the side walls. D: H. Browne. Eng & Min J 99:412-13 F 25. Mr J 100:548-9 O 16 '15
English reverberatores. H: L. Charles. Eng

Walls. D' H. Browne. Eng & Min' o 33.412-16 F 27 '15
Fettling reverberatories. H: L. Charles. Eng & Min J 100:648-9 O 16 '15
Flexible heat-treating installation. il diag Iron Age 96:507-10 S 2 '15
Furnace curves. R. J. Weitlaner. Met & Chem Eng 13:425-8 Jl '15
Furnace for making steel from ore, diags Iron Tr R 57:743+ O 14 '15
Heating an open-hearth furnace by tar. A. Greiner. Iron Age 95:1072-3 My 13 '15; Same. Engineer 119:495 My 14 '15; Same. Iron Tr R 56:1017-18 My 20 '15; Abstract. Met & Chem Eng 13:445 Jl '15
Improvements for Ropp roasters. E, Hall. diag Eng & Min J 100:147-8 Jl 24 '15
Internally fired nail bluing furnace. il Iron Age 95:1295 Je 10 '15
Laist roasting patents. diags Eng & Min J

Laist roasting patents. diags Eng & Min J 99:282-4 F 6 '15

Low-pressure oil-burning metallurgical furnaces. il Met & Chem Eng 13:510-11 Ag '15

Modern plant for rolling iron; St. Louis screw co. H. C. Estep. il diags plans Iron Tr R 57:82-9+ Jl 8 '15

New ingot heating furnace, il diags Engineer 120:162-4 Ag 13 '15

New iron mill equipped to assure low costs.
O. J. Abell, il diag Iron Age 96:75 Jl 8 '15

Furnaces, Metallurgical -Continued

urnaces, Metallurgical—Continued
New system for burning powdered coal in metallurgical furnaces. C. F. Herington. ii plans Eng N 73:1028-30 My 27 '15
Newnam hearth. W: E. Newnam, il Am Inst Min E Bul 100:628-30 O 16 '15; Same. Eng & Min J 100:628-30 O 16 '15; Excerpts. Met & Chem Eng 13:274 D 15 '15
Notes on the reverberatory furnace. F. R. Pyne. Met & Chem Eng 13:292-3 My '15
Perkins gas-fired reverberatory furnace. plan Eng & Min J '100:190 Jl 31 '15
Petroleum as fuel under boilers and in furnaces for heating, melting, and heat treatment of metals. W. N. Best. Il diags Am Inst Min E Bul 104:1530-7 Ag '15; Excerpt. Met & Chem Eng 13:767 O 15 '15
Problems in burning powdered coal. A. S.

Problems in burning powdered coal. A. S. Mann. il diags Gen Elec R 18:920-4, 959-65 S-O '15; Same. Iron Age 96:632-4 S 16 '15

Producer gas for heat treating, il diags Iron Tr R 57:521-3 S 16 '15

Protecting reverberatory walls at Douglas, Ariz, F. Rutherford, Eng & Min J 100:843 N 20 '15

Rectangular mechanical furnaces. G. diags Eng & Min J 99:181-3 Ja 23 '15

Repairing metallurgical furnaces with air guns. Met & Chem Eng 13:416 Jl '15

Rissmann & Ruebel roasting furnace, diag Eng & Min J 99:326 F 13 '15

Simple furnace for melting brass. R. F. vert. il Ry Age (Mech ed) 89:36 Ja '15

Standardizing air furnace practice. A. L. Pollard. Foundry 43:412-13 O'15

Tests of natural gas-fired brass furnaces. F. L. Wolf and R. B. Burr. diags Foundry 43:153-7 Ap '15

Thermal insulation of high-temperature equipment, P. A. Boeck, diags Am Inst Min E Bul 104:1539-50 Ag '15; Excerpts, Iron Age 96:353-4 Ag 12 '15

Two die and shell hardening furnaces, il Iron Age 96:79 Jl 8 '15 Washed metal, H: D. Hibbard, il plan Am Inst Min E Bul 108:2387-94 D '15

Waste-heat boilers, O. Monnett, diags Power 11:196-7 F 9 '15; Same, Eng & Min J 99: 368-9 F 20 '15

Wilfley Tilfley rotary-hearth roaster, il Eng & Min J 99:414-15 F 27 '15

Wood-burning assay furnaces. Met & Chem Eng 13:924-5 D 1 '15

Zinc smelters' roasting furnaces. Eng & Min J 99:420 F 27 '15

See also Blast furnaces; Crucibles; Cupola Electric furnaces; Metallurgy;

Furniture

Designs of built-in furniture. J. G. Dempsey. il Bldg Age 37:57-8 O '15 See also Cabinet making; Chairs; House decoration; Sewing cabinets

Furniture stores

lectrical service in furniture store of the Paine furniture company, Boston. il Elec W 65:674-5 Mr 13 '15 Electrical

Fuses, Electric. See Electric fuses

Fusible plugs usible plugs
Investigation of fusible tin boiler plugs, G: K.
Burgess and P. D. Merica, il U S Bur Stand
Tech Pa 53:1-37 '15; Same cond. J Ind &
Eng Chem 7:824-9 O '15; Abstracts, Iron
Age 95:1403-4 Je 24 '15; Am Gas Light J
103:29-30 Jl 12 '15; Am Soc M E J 37:654 N
'15; Power 42:733-4 N 23 '15

Investigation of fusible tin boiler plugs. G. K. Burgess and P. D. Merica. Metal Ind n s 13: 321 Ag '15; Same. Elec W 66:303-4 Ag 7 '15; Same. Power 42:190-1 Ag 10 '15; Same. Met & Chem Eng 13:568 S 1 '15

Fusion, Latent heat of
Specific heat and heat of fusion of ice. H. C.
Dickinson and N. S. Osborne, diags U S Bur
Stand Bul 12:49-81 O 28 '15; Abstracts. J Fr
Inst 179:489-91 Ap '15; Power 41:565 Ap 27
'15; Am Soc M E J 37:294-5 My '15

G

Gages

Accurate tapered plug gages. J: Mahon. diags Mach 21:320 D '14
Combined wheel and track gage. C. M. Feist. diag Elec Ry J 46:238 Ag 7 '15
Condition gage for centrifugal pumps. G: M. Peek. diag Eng N 72:1268 D 24 '14
Cylinder testing gage. H. E. McCray. diag Mach 21:749 My '15
Devices for measuring the flow of sewage. E: Wright, jr., and others. il diags Boston Soc C E J 1:439-54 O '14; Same. Eng & Contr 43:508-11 Je 9 '15
Equipment and methods in largest refrigeration system. C: H. Bromley. il diags Power 41:9-10 Ja 5 '15
External scale depth gage. E. Lea, diag Mach 21:828 Je '15
Gages for measuring rail wear. A. R. Bailey.

External scale depth gage. E. Lea. diag Mach 21:828 Je '15 Gages for measuring rail wear. A. R. Bailey. il Elec Ry J 46:1042 N 20 '15 Gaging shrapnel shells. il diags Mach 21:638-9

Ap. 11.
Limit gage for distance between an inside and an outside surface. diags Mach 21:493 F '15
Limit gage for measuring recessed work, M. T.
Byrne. diags Mach 21:469 Ja '15
Setting of angle gages. W: S. Rowell. Mach 21:
743 My '15
Simple and efficient recording gage for weir measurements. il diags Eng N 73:829-31 Ap

Simple and efficient recording gage for measurements. D: E. Adams and E. I. Roberts, il diags Eng N 73:1135-6 Je 10 '15 Taft-Peirce tool-room specialties, il Mach 21: 835-6 Je '15

835-6 Je '15 Thread tool gages, diags Mach 21:784-5 Je '15 See also Draft gages; Micrometers; Pressure gages; Water gages

Galactan

Galactan determination. W. H. Dore, J Ind & Eng Chem 7:721-2 Ag '15

Galactose pentacetate

alactose pentacetate
Conversion of galactose pentacetate to an
isomeric form. C. S. Hudson and H. O.
Parker. Am Chem Soc J 37:1589-91 Je '15
Existence of a third crystalline pentacetate
of galactose. C. S. Hudson. Am Chem Soc J
37:1591-3 Je '15

Galleries, Art. See Art galleries

Galvanic batteries. See Electric batteries Galvanizing

Corrosion of iron pans in zinc melting. Eng & Min J 100:478 S 18 '15
Determination of rainfall rates, Pawtucket, R. I. G: A. Carpenter. il Eng N 74:148-9 Jl 22 '15

22 '15
Determination of spelter coating on sheets and wire. J. A. Aupperle. Metal Ind n s 13: 329-30 Ag '15: Same. Iron Age 96:132 Jl It '15: Same (Maintaining galvanizing standards) Iron Tr R 56:1310+ Je 24 '15
Galvanizing malleable castings. E. Touceda Foundry 42:470+ D '14; Same. Iron Tr E 55:1137-8 D 17 '14
General electric practice in sherardizing. i diags Iron Age 96:1108-10 N 11 '15

Hot galvanising. H. Chambers. plan Engineer 120:160-2 Ag 13 '15

Practical side of sherardizing. C. L. Lucas, i Mach 21:361-4 Ja '15; Same. Sci Am S 79 212-13 Ap 3 '15

rotective coatings for iron and steel. E. P Later. Foundry 42:498; 43:35+ D '14-Ja '14 Protective Sherardizing; abstract. S. Trood. Am Soc M F J 37:656 N '15

Testing spelter coating in France. C: Coulon Iron Tr R 57:401; Discussion. J. A. Aup-perle. 57:401 Ag 26 '15

See also Electroplating

Galvanometers

meters; the most efficient combination of thermopile and galvanometer resistance W. W. Coblentz. pls U S Bur Stand Bu 11:177-82 N 15 '14 Galvanometer

See also Electric measurement

#### Galveston, Texas

#### Hurricane, 1915

Builders of the causeway tell of the storm's effect. Eng Rec 72:276 Ag 28 '15 Curbing the sea at Galveston. H: M. Robert. il Sci Am 113:268 S 25 '15 Effect of Galveston storm on seawall and causeway. R. P. Babbitt. Eng N 74:427 Ag 26 '15 Galveston adopts plan to strengthen its water-

front defense against future storms. il diag Eng Rec 72:576-7 N 6 '15 Rec

Galveston storm damage, il Eng N 74:469-72 Galveston survives hurricane, il map Eng N

Galveston survives hurricane. il map Eng N 74:424-6 Ag 26'15
Galveston's sea-wall checks hurricane's devastation. E. B. Van de Greyn. il diags Eng Rec 72:271-5 Ag 28'15
Gulf storms and the recent Galveston flood. E. L. Corthell. Eng N 74:758 O 14'15
John B. Hawley confirms view that sea-wall saved Galveston. Eng Rec 72:276 Ag 28'15
Metal roof coverings in Galveston hurricane. C: D. Puckett. il Metal Work 84:336 S 10'15
Meteorological analysis of storm indicates similarity to hurricane of 1990. map Eng Rec 72:275-6 Ag 28'15
Rush work after storm restores Galveston's water supply and rail connections. E. B. Van De Greyn. il Eng Rec 72:500-1 O 23'15

Water supply

New well water supply of Galveston, Texas. H. G. Wheaton. il Eng & Contr 44:385-6 N

Gamble, Francis Clarke, 1848-President of the Canadian Soc. C. E. G. R. G. Conway. por Eng N 73:392-3 F 25 '15

Game protection

Forests and game preservation. O. H. Van Norden, il Am For 21;111-16 F '15

Gangrene

Quinine in the treatment of gaseous gangrene. K. Taylor. Sci Am S 80:242-3 O 16 '15

Gangways

Emergency marine gangway, il Sci Am 112: 410 My 1 '15

Ganister

Ganister-lined converters, J: Gregson, Iron Age 94:1292 D 3 '14

Garage association, National. See National garage association

Garages

A. C. A. opens its new annex garage. il plan Horseless Age 35:135-6 Ja 27 '15 Building garage over a creek. Automobile 33: 286-7 Ag 12 '15 Garage building built with a purpose. il Horseless Age 36:295-6 S 15 '15 Garage built of concrete blocks. il Bldg Age 37:39 Ap '15 Garage pusiness—buildings equipment methods.

Garage business—buildings, equipment, methods. P. M. Heldt. il Horseless Age 36:394-5 O Garage of unique conception, il Bldg Age 37: 25-6 O '15

Garage on estate of Edward C. Schaefer, Esq., New Rochelle, N. Y.; views and plan. Brickb 24:190 Ag '15 Handling transients at the small garage. Horseless Age 35:858-60 Je 23 '15

Making courtesy work for you. Horseless Age 34:313-14 Ag 26 '14

Problem of handling the transient customer; how the garage men of Long Island are get-ting along with little live storage. H. H. Brown. Horseless Age 35:637-40 My 12 '15

Specializing on Ford cars. Horseless Age 35: 560c Ap 28 '15

Storage and handling of gasoline in the garage. H. T. Wade, il Sci Am 112:12-13 Ja 2 '15

System in a New Hampshire garage, il Horseless Age 35:633 My 12 '15
Up-to-date garage on the Santa Fe trail, il Horseless Age 35:636 My 12 '15

Well planned plant and how it's run; Southern motors co., Louisville, Ky. il Horseless Age 35:629-33 My 12 '15

Where system pays in a modern garage— two branches of Royal garage in New York, il Horseless Age 36:203-5 Ag 15 '15

See also Automobile service stations

### Accessories department

Card records in selling accessories. Horseless  $Age^{-35;229-30}$  F 17 115

accessory sales, il

Age 35:229-30 F 17 15
Combining storage and accessory sales, il
Horseless Age 35:683-4 My 19 15
Making the specialty demonstrate itself,
M. E. Faber, Horseless Age 36:89 Jl 21 15
Merchandizing of automobile accessories,
E. A. Cassidy, Horseless Age 35:857-8 Je 23
15

## Accounting

Apportionment of expense items. Horseless Age 35:367-8 Mr 17 '15

### Equipment

Another electrical adjunct to the gasoline automobile. il Elec W 66:981 O 30 '15 Garage alarm, diags Elec R & W Elec'n 66: 387-8 F 27 '15 New A. C. A. garage uses ramps. il plan Automobile 32:328-9 F 18 '15 Outfit for truing valves. D. A. Hampson. diag Horseless Age 35:847 Je 23 '15

#### Heating and ventilation

Heating a a garage, plan Metal Work 84:16-17

J1  $^2$   $^{1}$ L5 Heating and ventilating stables and garages. C: L. Hubbard. diags Dom Eng 72:168-70 Ag 7  $^{1}$ L5 Heating system for a garage. plans Dom Eng 72:375 S  $^{2}$ S  $^{1}$ L5 Hot water heating system for garages. il Dom Eng 72:228-9 Ag  $^{2}$ L  $^{1}$ L5

### Laws and regulations

Laws and regulations

Amendments moderate stringent garage laws.

Horseless Age 36:30-1 Jl 7 '15

Boston's new garage laws now effective.

Horseless Age 35:136-7 Ja 27 '15

Fight against garage regulations in New York state. Horseless Age 34:361+ D 16 '14

Garage men protest against 50-foot rule in New York. Horseless Age 35:138-50 Ja 27 '15

Reasonableness of ordinance as to garages.

Horseless Age 34:349 D 9 '14

Why is an oil separator? R. H. Johnston. diags Horseless Age 36:297-8 S 15 '15

Garages, Electric Constant-potential charging system effects saving in Chicago garage. il Elec W 65:865-6 Ap 3 '15

Ap 3 '15
Electric commercial car garage in Chicago. il
Elec R & W Elec'n 67:713-14 O 16 '15
Electric vehicle operation—an actual service
study. A. S. Wells, plan Elec R & W Elec'n
66:465-6+ Mr 6 '15
Electrical equipment of garages. N. G. Meade.
il diags Elec R & W Elec'n 66:53-4+ Ja 2 '15
New electric garage for charging on the constant-potential system. il Elec R & W Elec'n
65:1111-12 D 5 '14
New York's co-operative electric garage. il
Elec R & W Elec'n 66:659+ Ap 3 '15; Elec
W 65:810 Mr 27 '15
Operating features of large electric-vehicle

Operating features of large electric-vehicle garage. il diags Elec W 66:1145-7 N 20 '15

Garages, Municipal

Baltimore's municipal garage; itemized costs of operation and maintenance, W. T. Childs. il Munic J 38:463-6 Ap 8 '15

Municipal garage at Cincinnati. K. C. Card-well. il Munic J 38:1-3 Ja 7'15

Oakland municipal garage. Eng N 74:1033 N 25 '15

## Garages, Portable

Automobile sheet metal work in western city. il Metal Work 84:152-3 Jl 30 '15

Garbage. See Refuse and refuse disposal

Garbage collection. See Refuse collection Garden cities

Billerica garden suburb. A. C. Comey. il plan Eng N 73:815 Ap 29 '15

## Gardening

See also Electrohorticulture; Garden cities; Gardens

Gardens

Garden on an English estate; Woolley Hall. E: W. Gregory, il Brickb 24:99-100 Ap '15 Recent aspects of garden design. H. D. Eber-lein, il Arch Rec 37:300-19 Ap '15

Gary, Indiana Trade school idea at Gary. il Bldg Age 37:25-8 S '15

s'15

ias

Effect of leaking illuminating gas on bituminous pavements. E. C. Jones. Am Gas Light J
102:25 Ja 11'15

Effect of leaking illuminating gas on bituminous pavements. G: C. Warren. Eng &
Contr 42:405 O 28'14; Excerpts. Eng N 73:
441 Mr 4'15

Effects of gas light upon colored fabrics. Am
Gas Light J 102:116 F 22'15

Gas as a case-hardening agent. A. H. White
and H. T. Wood. bibliog il Am Gas Light J
103:259-63, 266 O 25'15

How producer gas is used for drying molds
and cores and for heating ladles in English
foundries. il Foundry 43:229-30 Je'15

Maximum contents of hydrocarbons in producer gas; abstract. F. Hoffmann. Am Soc
M E J 37:603 O'15

Separation of the illuminants in mixed coal
and water gas. G. A. Burrell and I. W.
Robertson. Am Gas Light J 101:295+ N 9
'14; Same. J Ind & Eng Chem 7:17-21 Ja'15

Sec also Acetylene; Blast furnace gas;
Coal-tar products; Coke oven gas; Gas and
oil engines; Gas lighting; Gas manufacture
and works; Gas power plants; Gas producers; Gases; Petroleum

Analysis

#### Analysis

Scc Gas analysis

#### Cost

Cost and price of gas in a small city. W: C. Butterworth. Am Gas Light J 102:180-3 Mr

producer gas a competitor? J. Am Gas Light J 103:42-3 Jl 19 '15

#### Ignition

Automatic and distance lighters for indoor lamps, C. W. Jordan, diags Illum Eng Soc 9:880-7 no 8 '14

Pilot flame ignition of incandescent gas lamps

C. W. Jordan. diags Am Gas Light J 103: 214-15 O 4 '15
Report of committee on piping large buildings for gas; system of control. diags Am Gas Inst Pro 9;pt 2, 1424-30 '14

See also Automobile engines—Ignition devices; Gas and oil engines—Ignition

## Rates

See Gas rates

## Standards

Essentials of modern gas composition. W: Cranfield, Am Gas Light J 102:307-10 My 17

Fixed calorific standard—a new use for gas coke. N. H. Humphrys. Am Gas Light J 102: 73 F 1 '15

ormal order establishing 520 B. T. U. as Canadian standard. Am Gas Light J 103: Formal

Gas testing ordinances: coming of calorimetry.
J. Abady. il Am Gas Light J 101:369-71 D
14 '14

Operating experiences under a calorific standard; symposium. Am Gas Inst Pro 9:pt 1, 367-78 '14

Standards for gas and electric service in Illinois. Eng N 72:1148-9 D 10 '14
Standards for gas service. U S Bur Stand Circ 32:1-190 '15

## Testing

See Gas testing

Gas, Natural
Absorption of gasoline vapor in natural gas
by fuming sulfuric acid. R. P. Anderson and
C. J. Engelder. J Ind & Eng Chem 6:989-92
D '14

Analysis of natural gas and illuminating gas by fractional distillation at low temperatures and pressures. G. A. Burrell, F. M. Seibert

and I. W. Robertson, diags U.S. Bur Mines Tech Pa 104:1-38 '15; Excerpts. Am Gas Light J 103:315 N 15 '15; Same, Met & Chem Eng 13:851 N 15 '15 Blast lamp for natural gas, H. C. Chapin, il J Ind & Eng Chem 7:46-7 Ja '15 Capillary concentration of gas and oil. C. W. Washburne, Am Inst Min E Bul 93:2365-78 S '14; Discussion, 100:831-46; 101:1203-4 Ap-My '15

My '15
Cementing a gas well in salt water, diag Concrete Cem 5:254 D '14
Composition of the natural gas used in twenty-five cities; with a discussion of the properties of natural gas. G. A. Burrell and G. G. Oberfell. U S Bur Mines Tech Pa 109: 1-20 '15; Excerpt (Rare gases in natural gas). Sci Am S 80:235 O 9 '15; Excerpt (Physiological effect of natural gas). Sci Am S 80: 303-4 N 6 '15
Condensation of gasoline from natural gas.

G: A. Burrell, F. M. Seibert, and G. G. Oberfell. diags pls U S Bur Mines Bul 88: 3-100 '15; Excerpts. Automobile 33:92 J1 8

Conditions of natural gas in the earth's strata. G: A. Burrell. J Ind & Eng Chem 7: 322-4 Ap '15 Engineering problems arising in the trans-

o22-4 Ap 15 Engineering problems arising in the trans-portation of natural gas. J. P. Fisher. Am Soc M E J 37:374-7 Jl '15 Gas and oil wells through coal seams; dis-cussion. Am Inst Min E Bul 100:846-58 Ap

'15
Gasoline engine run on natural gas. L. H.
Morrison. Power 41:821 Je 15 '15
Gasoline from natural gas. F. E. Matthews.
Power 42:677-8 N 16 '15
House heating with natural gas for fuel. F. R.
Hutchinson. il Metal Work 84:9-12+ Jl 2 '15
Natural gas industry in the Appalachian region. Am Gas Light J 103:150 S 6 '15
Natural gas production in 1914. Am Gas Light
J 103:230 O 11 '15

New competitor of acetylene. J. F. Springer. Mach 21:903 Jl '15

Physical laws of methane gas. P. F. Walker. Am Soc M E J 37:176-9 Mr '15

Possible substitute for acetylene in welding and cutting; by-product of natural-gas gaso-line. J. F. Springer. Ry Age (Mech ed) 89: 529-30 O '15

Probable oil and gas in Montana. J. P. Rowe. Eng & Min J 99:647-9 Ap 10 '15

Regulation of oil and gas wells in California. L: H. Eddy, Eng & Min J 100:383-4 S 4 '15

Rôle and fate of the connate water in oil and gas sands. R. H. Johnson. Am Inst Min F Bul 98:221-6 F '15: Discussion. 101:1157-62: 103:1449-59; 105:2057-60 My, Jl, S '15

Separation of the constituents in a natural gas from which gasoline is condensed. G: A Burrell and F. M. Seibert. Am Chem Soc J 37:392-6 F '15

Variation in composition of natural gas from different sands in the same field, G. A. Bur-rell and G. G. Oberfell. J Ind & Eng Chem 7:419 My '15

Gas, Oil

as, Oil Improved Jones oil gas process at the Potrer gas works, San Francisco, E. C. Jones and L. B. Jones, il diag Am Gas Light J 103:23 26-7 Jl 12 '15

Time factor in making oil gas. M. C. Whit-aker and C. M. Alexander, diags J Ind & Eng Chem 7:484-95 Je '15

Bibliography

Bibliography of the chemistry of gas manufacture. W. F. Rittman and M. C. Whitaker U S Bur Mines Tech Pa 120:12-14 '15

Gas, Water
Automatic operation of a water gas set. C. F
Zeek. diags Am Gas Light J 102:395-6 Je
21 '15

Continuous production of water gas. diags . Ind & Eng Chem 7:541 Je '15

Examination of a condensate from carburetted water gas. E. T. Sterne. J Ind & Eng Chen 7:898-9 O '15; Same. Am Gas Light J 103 339 N 29 '15

Methods and facilities for specifying and testing blowers also measuring air and steam supply to the water gas generators. J. M. Spitzglass. Am Gas Inst Pro 9:pt 1, 615-66; Discussion. 9:pt 1, 666-77 '14 Oil tar separation, recovery and disposal. R. E. Wyant. Am Gas Inst Pro 9:pt 1, 313-19; Discussion. 319-39 '14 Physical constants of gas oils and derived tars. W. F. Rittman and G. Egloff. J Ind & Eng Chem 7:481-4 Je '15 Possible economies from the use of exhaust steam in a water gas plant. S. A. Reinhard and C. A. Schnerr. il plan Am Gas Light J 102:225-30 Ap 12 '15 Pure water gas production. diag Am Gas Light J 102:125-6 Mr 8 '15 Timer for water gas generator. il Am Gas Light J 102:155-6 Mr 8 '15 Water gas machine results. Am Gas Light J 103:131-2 Ag 30 '15

## Bibliography

Bibliography of the chemistry of gas manufacture. W. F. Rittman and M. C. Whitaker. U S Bur Mines Tech Pa 120:9-11 '15

as advertising. See Gas industry-Advertising

as analysis

as analysis

Analysis of natural gas and illuminating gas by fractional distillation at low temperatures and pressures. G. A. Burrell, F. M. Seibert and I. W. Robertson, diags U S Bur Mines Tech Pa 104:1-38 '15; Excerpts. Am Gas Light J 103:315 N 15 '15; Excerpts. Am Gas Light J 103:315 N 15 '15, Same. Met & Chem Eng 13:851 N 15 '15

Apparatus for the determination of sulfur in gas. E. R. Weaver and J. D. Edwards. diag J Ind & Eng Chem 7:620-1 JI '15; Same. Am Gas Light J 103:108 Ag 16 '15

Determination of benzol in gas mixtures. G. A. Burrell and I. W. Robertson. diag J Ind & Eng Chem 7:669-70 Ag '15; Same. Am Gas Light J 103:132-3 Ag 30 '15'

Determination of gases dissolved in waters and effluents. A. A. Swanson and G. A. Hulett. diags Am Chem Soc J 37:2490-500 N '15'

Determination of hydrogen in gas mixtures by means of colloidal palladium. G. A. Burrell and G. G. Oberfell. J Ind & Eng Chem 6:992-4 D '14

Determining the benzol in gas. A. Krigerdiag Am Gas Light J 102:299-300 My 10 '15 Equilibrium between carbon oxysulfide, carbon monoxide and sulfur. G. N. Lewis and W: N. Lacey. diag Am Chem Soc J 37:1976-83 S '15

Method for the determination of hydrogen sulphide in gas. A. B. Way. Am Gas Inst Pro 9:pt 1, 164-7 '14; Same cond. Am Gas Light J 101:364 D 7 '14; Discussion. Am Gas Inst Pro 9:pt 1, 167-78 '14

Rapid method of fractionating gases at low temperatures. G. A. Burrell and I. W. Rob-ertson. J Ind & Eng Chem 7:210-11 Mr '15

Reagents for use in gas analysis; alkaline pyrogallol. R. P. Anderson, diag J Ind & Eng Chem 7:587-96 Jl '15

Report on the gas chemist's handbook. W. H. Fulweiler. Am Gas Inst Pro 9:pt 1, 141-54; Discussion. 9:pt 1, 154-63 '14

Separation of gases by fractional distillation in a vacuum at low temperatures, G. A. Burrell and I. W. Robertson, J Ind & Eng Chem 7:209-10 Mr '15

Separation of the illuminants in mixed coal and water gas. G. A. Burrell and I. W. Robertson. diag Am Gas Inst Pro 9:pt 1, 219-32 '14; Same cond. Am Gas Light J 101:295+N 9 '14; Same cond. J Ind & Eng Chem 7: 17-21 Ja '15; Discussion. Am Gas Inst Pro 9:pt 1, 232-4 '14

Specific absorption of reagents for gas analysis. R. P. Anderson, J Ind & Eng Chem 7: 587 Jl '15

Gas and oil engines Blackstone oil engine, il plan (supp) Engineer 119:402-4 Ap 23 '15

Charging of two-cycle internal combustion engines: abstract. B. Hopkinson. diags Am Soc M E J 37:126-7 F '15

Convertible combustion engines, A. E. L. Chorlton, diags Engineer 119:201-3 F 26 '15; Same cond. Power 41:556-7 Ap 20 '15; Abstract, Am Soc M E J 37:239-41 Ap '15 Distribution of heat in the cylinder of a gas engine. A. H. Gibson and W. J. Walker, diags Engineer 119:550-1 Je 4 '15; Same cond. Power 41:824-5 Je 15 '15; Abstract, Am Soc M E J 37:417-18 JI '15 Dunn heavy oil engine. il Concrete Cem 7:159-60 O '15

60 O '15 Eight-cylinder gasoline engine for railway traction. H: G. Chatain, il Power 41:214-15 F 9 '15

traction. H: G. Chatain, il Power 41:214-15
F 9 '15
Farm tractors and their motors, P. S. Rose,
Horseless Age 35:799-800 Je 16 '15; Abstract,
Eng M 49:750-2 Ag '15
Forty years' advance in internal-combustion
engines, il Power 41:376-8 Mr 16 '15
Gas blowing engines at the Steelton plant of
the Pennsylvania steel company, il Met &
Chem Eng 13:516-19 Ag '15
Gas blowing engines for the Pennsylvania steel
co, il Iron Age 96:12-14 Jl 1 '15
Gas-engine tendencies, A. E. Ward, diags
Power 41:186-90 F 9 '15; Discussion, J: F.
Wentworth, 41:383-4 Mr 16 '15
Gas engines replace a steam turbine power
plant, C. L. Follmer, il plan Power 42:670-4
N 16 '15
Handy gasoline engine formulas, W. F.
Schaphorst, Iron Age 96:414 Ag 19 '15

plant. C. L. Follmer. il plan Power 42:670-4 N 16 '15
Handy gasoline engine formulas. W. F. Schaphorst. Iron Age 96:414 Ag 19 '15
Heater utilizing gas engine exhaust. diag Iron Age 96:413 Ag 19 '15; Same. Metal Work 84:317 S 3 '15
Heavy-duty kerosene engine and generator. il diag Elec W 66:548-9 S 4 '15
Heavy oil engine, its present status and future development. A. H. Goldingham. il diags Am Soc M E J 37:628-36 N '15; Excerpts. Iron Age 96:1313-15 D 2 '15
History of the large gas engine. H. Hubert. Iron Tr R 56:1011-16+ My 20 '15
History of the twelve-cylinder motor. E. W. Walford. il Automobile 32:500-1 Mr 18 '15
Hot-bulb oil engine. E. Lundgren. diags Power 41:79-81 Ja 19 '15
How to select your prime mover. G. Fisk. Iron Tr. R 57:569-72+ S 23 '15
Immediate gas engine business for gas companies. H. W. Edmund. il diag Am Gas Light J 102:275-7 My 3 '15
Installation of a gas engine. T. L. Hobbs. Mach 21:204-5 N '14; Same. Sci Am S 79: 55 Ja 23 '15
Internal-combustion engine dimensions. H. L. Watson. Power 41:672-4 Mr. 18 '15

15 Ja 23 15 Internal-combustion engine dimensions. H. L. Watson. Power 41:672-4 My 18 '15 Internal combustion engines from a commercial standpoint. J. G. Walthew. Engineer 118:539 D 4 '14

118:539 D 4 '14
Internal-combustion vs. the steam engine.
Power 42:513-14 O 12 '15
Investigation of a gas driven air compressor
plant at the mine Consolidation. Am Soc M
E J 37:112-13 F '15
Junkers oil engine. F. E. Junge. diags Eng M
48:689-93 F '15
Large blast furnace gas engines. H. Hubert.
il diags Engineer 119:511-14, 524-5 My 21-28

Latest Campbell oil engine. il Engineer 119: 44 Ja 8 '15
Lauson heavy-duty kerosene engine. diags Power 41:116-17 Ja 26 '15
Locomobile driven by suction producer gas; abstract. Gwosdz. diags Am Soc M E J 37: 713-15 D '15

Low grade fuel oil engine for general service. diag Eng & Contr 42:371 O 14 '14

New type of internal combustion engine: abstract. H. F. Fullagar. diags Am Soc M E J 37:127-8 F '15

Nordberg high compression oil engine il Ry Age (Mech ed) 89:487 S '15; Same. Elec W 66:374 Ag 14 '15; Same. Iron Age 96:141 JI

Oil engine for off-peak load. L. H. Morris. Power 41:351-2 Mr 9 '15

Oil ploughing engine; plan. Engineer 120:36 Jl 9 '15

Operating an outlaw engine. F. W. Robinson, diag Power 42:625-6 N 2 '15

Gas and oil engines—Continued

Panama-Pacific exposition. F. R. Low. il diags Power 42:261-6, 290-3, 341-2, 374-7 Ag 24-S 14 '15

24-8 14 15
Parallel operation of alternating current generators driven by internal combustion engines; factors affecting engine design. H. C. Lehn. Gen Elec R 18:174-8 Mr '15
Petrol rail coach engine, diags Engineer 119: 426-7 Ap 30 '15

Present status of prime movers. H. G. Stott, R. J. S. Pigott and W. S. Gorsuch. Am Inst E E Pro 33:962-75 Je '14; Discussion. 34:85-102 Ja '15 102 Ja

Processes of combustion in a hot bulb engine; abstract. E. Weisshaar. Am Soc M E J 37: abstract. E 650-1 N '15

Royal agricultural show at Nottingham, il diags Engineer 120:58-9 Jl 16 '15 Service of a fuel oil engine in a railway pumping station, il Ry Age 58:1444-5 Je 18

mall electric generating stations; applicability of oil engines for plants in small towns, G. C. Shaad, il plan Elec W 65:923-5

Ap 10 '15 Small self-contained generating plant, il Elec W 66:421 Ag 21 '15 Stop for gasoline engine. S. A. Standley, plan Power 40:534 D 15 '14 Uto two-stroke cycle engine; abstract. P. Os-tertag, diag Am Soc M E J 37:343-4 Je '15 Venn-Severin two-stroke-cycle oil engine, il Elec W 66:939 O 23 '15

When the gas engine will not start. E. N. Percy. Power 41:299-300 Mr 2 '15

See also Aeroplane motors; Automobile engines; Diesel engines; Gas producers; Gas tractors; Heat engines; Locomotives, Gas and

#### Accidents

Gaseous explosions. D. Clerk. Sci Am S 79: 288 My 1 '15

Peculiar gas-engine accident. il Power 40:935; 41:203-4 D 29 '14, F 9 '15

## Cooling

Gas-engine cooling water, G. A. Field, diag Power 41:438 Mr 30 '15

Injection of water in internal combustion engines. P. H. Berggreen. Sibley J 29:134 Ja

Recovery of heat losses in internal combustion engines; abstract. J. B. Merriam, diag Am Soc M E J 37:295-6 My '15

See also Automobile engines-Cooling

# Cost of operation

Operating costs for oil-engine installations. Elec W 66:805-7 O 9 '15

#### Fuel

Analysis and valuation of motor fuels—14 methods for examining them; from German data. Automobile 33:202-5, 247-9+ J1 29-Ag 5 '15

Combustion of benzole in internal combustion engines, E. Terres, Am Soc M E J 37:46-8 Ja '15

Gas engine needle valve settings. B. R. Ware. Int Marine Eng 20:226-7 My '15

Gas operated internal combustion engines; relative cost of operation compared with liquid fuel when used for power. H. W. Edmund. Metal Work 84:141-2 Jl 30 '15

Initial temperatures of combustible gases and liquids; abstract. O. Binder. Am Soc M E J 37:554 S '15

Liquid fuels for internal combust gines. Engineer 119:408-9 Ap 23 '15 combustion en-

#### Ignition

Effects of varying mixture and ignition timing. V: R. Gage. Power 42:720-2 N 23 '15

Electric ignition devices for gas engines. il Sci Am S 78:357 D 5 '14

## Lubrication

Motor cylinder lubrication; abstract. G. S. Bryan. Am Soc M E J 37:293-4 My '15

#### Manufacture

Allowances for gas engine piston fits: abstracts. E. W. Weaver. Mach 21:491 F '15; Horseless Age 35:110-11 Ja 20 '15; Power 41: 245 F 16 '15 245 F 16 '15 How Stout institute students cast a gasoline engine. F. F. Hillix. il Foundry 43:99-102

#### Testing

Operating and test data for a fuel-oil engine and generator, R. B. White. il diag Elec W 65:1688-9 Je 26 '15
Test of a 16-hp. Petter oil engine. C: S. Salfeld. Power 41:405 Mr 23 '15
Vertical tandem gas engine. il diags Engineer 120:208 Ag 27'15

## Valves

Gas engine needle valve settings, B. R. Ware. Int Marine Eng 20:226-7 My '15

Gas and oil engines, Marine
Common troubles with the marine gas engine
and suggestions for determining and remedying. J. B. Sadler. Int Marine Eng 20:41315 S '15

Installation of 120 horsepower Bolinder oil engine in pilot schooner Gracie S. il plans Int Marine Eng 20:158-60 Ap '15
Largest commercial gasoline engine ever built. il Sci Am 112:588 Je 12 '15
Marine oil engines for commercial work, il Int Marine Eng 20:495-7 N '15
Oil and suction producer gas engines for ship propulsion; abstract. Am Soc M E J 37:602
O '15
Present position of the market in the second content of the se Installation of 120

Present position of the marine distillate (par-affin) engine. C: J. Belden. Int Marine Eng 20:225-6 My '15 Thermodynamics of the marine oil engine. J: F. Wentworth. Power 41:145-8 Ja 26 '15

Gas appliances

Domestic fuel appliances from the consumer's point of view. Am Gas Light J 102:70-1, 74-

Industrial appliance business; with discussion. W. H. Bradley. Am Gas Light J 102:210-12 Ap 5 '15

W. H. Bradley. Am Gas Light J 102:210-12
Ap 5 '15
Industrial fuel development. S. T. Willson.
il Am Gas Light J 103:82-4 Ag 9 '15
Industrial gas appliance for the home, school and factory. G. L. Powers. Am Gas Light J 103:93 Ag 9 '15
Industrial gas problems; general instructions—consumption on typical installations—candy making—coffee roasting—packing houses. F. S. Dewey. Am Gas Light J 102:31, 394-5 Je 21 '15
Industrial showrooms of the Gas light and coke company, Goswell Road, E. C. il Am Gas Light J 103:101 Ag 16 '15
Industrial uses of gas at the Panama-Pacific international exposition. J; B. Redd. Am Gas Light J 103:167-7 S 6 '15
Refrigeration by gas. H. M. Soper. Am Gas Light J 103:166-7, 10-11 Jl 5 '15
Relations between gas companies and dealers. Am Gas Light J 103:6-7, 10-11 Jl 5 '15
Report of committee on piping large buildings for gas; fuel illustrations. Am Gas Inst Pro 9:pt 2, 1440-86 '14
Report of the committee on the utilization of gas appliances. il diags Am Gas Inst Pro 9:pt 2, 1511-41; Discussion. 1541-55 '14
Typical industrial appliances. il Am Gas Light J 103:85-7, 90-3 Ag 9 '15
What is being done by manufacturers of appliances to encourage the use of gas. S. Grady. Am Gas Light J 102:87 F 8 '15

See also Gas cooking

See also Gas cooking

### Gas as fuel

As as fuel

Accident to a boiler fired with producer gas.

Am Soc M E J 37:116 F '15

Comparison of the economy of powdered coal,
oil and water gas for heating furnaces. C. F.

Herington. Eng N 72:1156-8 D 10 '14

Design of surface combustion appliances.
C: E. Lucke. diags Sch Mines Q 36:95-122,
233-48 Ja-Ap '15

English continuous billet furnace. il diags Iron

Tr R 57:841-2 O 28 '15

English gas-fired melting furnaces, diag Am Gas Light J 102:140 Mr 1 '15

Gas as fuel — Continued

as as ruel—Continued Fuel values of coal, gas and oil; operators of plants in Oklahoma compare costs on evap-oration-unit basis. Elec W 65:1170 Je 5 15 Gas and munitions of war. Hum Engr 8:364

Ag '15
Gas brazing furnace, diags Ry Age (Mech ed)
89:591-2 N '15
Gas fired boilers, Herr Birkholz, Am Gas
Light J 102:09-101 F 15-15
Gas furnace for heating soldering irons, R. H.
Parsons, plan Elec Ry J 46:24 Jl 3 '15
Gas operated internal combustion engines;
relative cost of operation compared with
liquid fuel when used for power, H. W.
Edmund, Metal Work 84:141-2 Jl 30 '15
Gas vs. electrically heated ovens, G: H.
Trout, Iron Tr R 57:526+ S 16 '15
Heat treatment of iron and steel in a neutral
atmosphere, A. H. White and H. T. Hood,
diag Am Gas Light J 103:310-11, 314-15 N 15

diag Am Gas Light J 103:310-11, 314-15 N 15
'15
House heating with natural gas for fuel. F. R.
Hutchinson. il Metal Work 84:9-12+ Jl 2 '15
Immediate gas engine business for gas companies. H. W. Edmund. il diag Am Gas
Light J 102:275-7 My 3 '15
Industrial fuel. F. W. Frueauff. Am Gas Light
J 103:267 O 25 '15
Industrial fuel development. S. T. Willson.
il Am Gas Light J 103:82-4 Ag 9 '15
Industrial gas. J. C. Shepard. il Am Gas
Light J 102:194-7 Mr 29 '15
Industrial gas problems. F. S. Dewey. Am Gas
Light J 102:194-7 Mr 29 '15
Industrial uses of gas. H. M. Thornton. il
Am Gas Light J 103:17-22 Jl 12 '15
Modern foundry pig-iron mixer; operating and
coke-oven gases; abstract. O. Simmersbach.
Iron Age 96:812-13 O 7 '15
New ingot heating furnace. il diags Engineer
120:162-4 Ag 13 '15
Power with by-product recovery. T. R. Wollaston. Engineer 119:326-7 Ap 2 '15; Same.
Sci Am S 80:42-3 Jl 17 '15
Producer gas for heat treating. il diags Iron
Tr R 57:521-3 S 16 '15
Report of industrial fuel committee, National

Report of industrial fuel committee, National commercial gas association, H: O. Loebell. Am Gas Light J 102:3-4 Ja 4 '15

Tests of natural gas-fired brass furnaces. F. L. Wolf and R. B. Burr, diags Foundry 43:153-7 Ap '15

Typical industrial appliances, il Am Gas Light J 103:85-7, 90-3 Ag 9 '15

See also Blast furnace gas; Coke oven gas; Coke ovens; Combustion, Surface; Gas; Gas burners; Gas cooking; Gas heating; Gas

### Gas associations

See also National commercial gas associa-

Gas burners
Burning blast furnace gas; Bradshaw-Huessener combustion arrangement, diags Iron
Age 95:612-13 Mr 18 '15

Efficiency relation existing between various argand and open flame test burners, F. H. Gilpin, diags Am Gas Inst Pro 9:pt 1, 379-401; Discussion, 401-4 '14

Gas burners in 2750-hp. office-building boiler plant. il diag Power 42:79-80 Jl 20 '15

Gas lighting development. T. Owens. il Am Gas Light J 103:193-7 S 27 '15

Hot-blast stove gas burners, il diags Iron Age 96:356-7 Ag 12 '15

Simple, durable, electrically operated gas-valve. Z. Ostenberg. il J Ind & Eng Chem 7: 872 O '15; Same. Am Gas Light J 103:279 N 1 '15

Simple gas burner for small laboratory furnaces. D. L. Randall, diag J Ind & Eng Chem 7:873 O '15

Utilization of blast furnace gas. A. N. Diehl. Iron Tr R 57:946-8, 993-7, 1040-2+ N 11-25 '15; Abstract. Iron Tr R 57:853-6 O 28 '15; Abstract, with discussion. Iron Age 96:988-90 O 28 '15

See also Acetylene burners; Blast lamps

Gas cleaning

Gas from blast furnaces, its cleaning and utilization. J. E. Johnson, jr. diags Met & Chem Eng 12:685-92, 760-9 N-D '14; Same. Sci. Am S 79:93-5, 110-12, 126-7, 142-3 F 6-27 '15 Gas-washing apparatus with enclosed filter. E. R. Weaver and J. D. Edwards. diags J Ind & Eng Chem 7:534-5 Je '15 Recent developments in the Doherty washer cooler as a gas condenser. R. B. Rowley. Am Gas Light J 103:231+ O 11 '15

See also Gas purification

Gas companies

See also Gas purification

ias companies
Continuous meter reading and discount system in Fond du Lac. F. G. Maxwell. Am
Gas Light J 102:205 Mr 29 '15
Free maintenance of all gas lamps by the gas
companies. J. P. Conroy. Am Gas Light J
102:119, 122-4 F 22 '15
House maintenance of gas lighting. W: O.
Weekes. Am Gas Light J 103:203-5 S 27 '15
House maintenance service. A. Hewitt. Am
Gas Light J 102:39, 42-3 Ja 18 '15
How can gas and electric companies under
one management render the best light service? A. B. Spaulding and N. H. Potter. Am
Gas Light J 103:218-19 O 4 '15
Is the sale of gas-electric fixtures by gas
companies desirable? R. F. Pierce. Am Gas
Light J 102:69-70 F 1 '15
Maintenance of house burners. H. C. Crafts.
Am Gas Light J 102:247, 250-1 Ap 19 '15
Orders and complaints. W. J. Clark. Am Gas
Light J 103:331-2 N 22 '15
Relations between gas companies and dealers.
Am Gas Light J 103:6-7, 10-11 Jl 5 '15
Report of N. C. G. A. committee on outdoor
gas lighting. il Am Gas Light J 102:117-19
F '22 '15

See also Gas industry: Gas lighting

See also Gas industry; Gas lighting

## Accounting

Accounting. P. S. Young. Am Gas Light J 103: 236 O 11 '15

Analyses of statements—units of cost. A. P. Post. Am Gas Light J 101:385-6 D 21 '14 Routine of billing and receiving department. W. P. Baird. Am Gas Light J 103:340-3, 346-7 N 29 '15

#### Advertising

See Gas industry-Advertising

#### Employees

Employees

Compensation of meter readers. H. P. Schaper. Am Gas Inst Pro 9:pt 2, 1683-7 '14; Same. Am Gas Light J 101:333 N 23 '14; Same. Eng & Contr 42:558-9 D 16 '14; Discussion. Am Gas Inst Pro 9:pt 2, 1687-1707 '14

Complaint man. E. J. DeMarsh. Am Gas Light J 102:401 Je 28 '15

How the shops can assist the commercial department in promoting friendly relations with the public. H. E. Turner. Am Gas Light J 102:380-1 Je 14 '15

Improvement of distribution employees. C. E. Reinicker. il Am Gas Inst Pro 9:pt 2, 1242-1302 '14; Same cond. Am Gas Light J 102: 33-9 Ja 18 '15; Discussion. Am Gas Inst Pro 9:pt 2, 1302-10 '14

National commercial gas association courses, and compulsory education. L. Galloway. Am Gas Light J 103:102-3; Discussion. 103: 103, 106-7 Ag 16 '15

#### Public relations

Address at the Minneapolis convention, N. C. G. A. T: N. McCarter. Am Gas Light J 102: 115-16 F 22 '15

as company from the consumer's point of view. J. H. Ingwersen. Am Gas Light J 102; 411-12 Je 28 '15

411-12 Je 28 '15 Relations with customers: discussion on the report of the N. C. G. A. committee. Am Gas Light J 102:149-51 Mr 8 '15

### Rates

See Gas rates

## Regulation

Northampton, Mass., rate case. Am Gas Light J 102:154-5 Mr 8 '15

Rented gas ranges. Am Gas Light J 102:326-7 My 24 '15

Gas companies—Regulation—Continued
Standards for gas service, U.S. Eur Stand
Circ 32:1-190 '15

Summary of commission regulations governing gas supply; table. J. B. Klumpp. Am Gas Light J 103:75 Ag 2 '15

Gas congress, International. See Ingas congress, San Francisco, 1915 International

Gas cooking
Domestic fuel appliances from the consumer's
point of view. Am Gas Light J 102:70-1, 74-6
F 1 '15

Gas kitchen equipment of the Biltmore hotel. C. F. Herington, il plan Am Gas Light J 102:170-2 Mr 15 '15' How to secure all-gas kitchens in old houses. H. K. Dodson, Am Gas Light J 101:406-7 D 28 '14

Gas distribution
Astoria tunnel under the East river for gas
distribution in New York city. J: V. Davies.
il map Am Gas Light J 103:225-30, 244-7+
O 11-18 15

O 11-18 '15
Great gas tunnel under the East river. J. F.
Springer. il Sci Am 113:380-1 O 30 '15
Installation and maintenance of services. R. B.
Duncan. il diags Am Gas Inst Pro 9:pt 2,
1052-1161; Discussion. 1161-82 '14
Motor-driven, high-pressure gas pumping installation. J. S. Haug. Am Gas Light J 103:
315-16 N 15 '15
Pining houses for gas lighting. H. B. Sterrett

315-16 N 15 '15
Piping houses for gas lighting. H. R. Sterrett.
Am Gas Light J 102:87, 90 F 8 '15; Same.
Illum Eng Soc 10:296-302 no 4 '15
Present practice of gas distribution by British
undertakings. W. Hole. il diags Am Gas
Light J 103:305-9, 323-7 N 15-22 '15
Report of committee on distribution, Iowa
district gas association. Am Gas Light J
102:403 Je 28 '15

Report of committee on piping large buildings for gas; piping plans. 4 fold charts Am Gas Inst Pro 9:pt 2, 1486a '14
Sizes of pipes for high pressure gas mains.
J. M. Spitzglass. il diags Am Gas Light J
102:49-52 Ja 25 '15

Welding of high pressure mains, J. D. Shat-tuck, il diags Am Ges Inst Pro 9:pt 2, 945-1011 '14; Same abr. Am Gas Light 1 102:54-5, 58-60, 66-9 Ja 25-F 1 '15; Discus-sion, Am Gas Inst Pro 9:pt 2, 1011-52 '14 See also Gas pipe lines; Gas pipes

Gas-electric fixtures. See Gas fixtures

Gas electric locomotives. See Electric locomo-

Gas engineering

Address before the Illinois gas association.

I. H. Johnson, Am Gas Light J. 102:193-4

Mr 29 '15

Suggested extension of the Dewey decimal system of classification to gas engineering. D. S. Knauss. Am Gas Inst Pro 9:pt 2, 1746-50: Discussion, 1750-7 '14

Gas lighting; Gas power plants; Gas safety

Gas engineers, New England association of See New England association of gas engineers

Gas engines. See Gas and oil engines

Gas explosions. See Explosions

Gas-filled lamps. See Electric lamps, Tungsten

Gas fitting

Educating fitters. Am Gas Light J 103:100 Ag

Physical installation of gas arcs. C. A. Luther. il Am Gas Inst Pro 9:pt 1, 876-91; Discussion. 892-902 '14

Proper specifications for and inspection of interior gas piping. A. E. Turner. Am Gas Inst Pro 9:pt 2, 1311-27 '14: Same (Standardizing gas piping specifications) Metal Work 82:764-7 D 11 '14; Discussion. Am Gas Inst Pro 9:pt 2, 1327-37 '14

See also Gas meters

Gas fixtures

Gas lighting development. T. Owens. il Am Gas Light J 103:193-7 S 27 '15

Is the sale of gas-electric fixtures by gas com-

panies desirable? R. F. Pierce. Am Gas Light J 102:69-70 F 1 '15 Report of committee on piping large buildings for gas; fixture illustrations. Am Gas Inst Pro 9:pt 2, 1374-1423 '14

See also Gas lamps

Gas flow

as now Gas volume and dust concentration determin-ation in connection with the Cottrell proc-ess. W: N. Drew. diags Am Soc M E J 37: 676-8 D '15

German apparatus for measuring pressure and

velocity of gases; abstract. E. Stach, diags Am Soc M E J 37:715-16 D '15 Note on the modified venturi formula for flow of gases or vapors. G. B. Upton. Sibley J 29:90-5 D '14

See also Gas measurement

Gas heaters
Fire-place heater design competition. il Am
Gas Light J 103:124 Ag 23 '15
Gas heater for commutators. R. H. Parsons.
diags Elec Ry J 46:280-1 Ag 14 '15
Heater utilizing gas engine exhaust. diag Iron
Age 96:413 Ag 19 '15; Same. Metal Work 84:
317 S 3 '15; Same cond. Ind Eng 15:89 S '15
Heating by means of gas burning appliances.
G: S. Barrows. il Dom Eng 70:171-4, 2013 F 6-13 '15; Same. Metal Work 83:765-8 My
28 '15

Report of N. C. G. A. committee on heating, ventilation and refrigeration. G; S. Barrows. Am Gas Light J 101:410-13 D 28 '14

See also Gas water heaters

Gas heating

as heating

How radiant heat from gas radiators is determined, plan Heat & Ven 12:24-6 My '15

Progress in gas heating science; with discussion, O. J. Kuenhold, Am Soc Heat & V E 20:299-319 '14

Report of N. C. G. A. committee on heating, ventilation and refrigeration. G: S. Barrows, Am Gas Light J 101:410-13 D 23 '14

Three methods of measuring radiant heat from gas fires. W. R. Twigg. il diags Heat & Ven 12:33-6 S '15

Ven Alan Cas heaters.

Gas holders. See Gasholders
Gas ignition. See Gas—Ignition

Gas industry

as incustry Address to the National commercial gas asso-ciation at Minneapolis. Am Gas Light J 101: 353-5 D 7 14 Address to the Pennsylvania gas association. L. R. Dutton, Am Gas Light J 102:273-5 My

An Gas Light J 102:273-5 My 3 '15 Address to the tenth annual meeting, Natural gas association of America. J. T. Lynn. Am Gas Light J 102:353-5 Je 7 '15 Aluminum in the gas industry. J Ind & Eng Chem 7:255-6 Mr '15 Domestic uses of gas. J. H. Gaylord. Am Gas Light J 102:298-9 My 10 '15 Gas industry and the war. N. H. Humphrys. Am Gas Light J 101:409-10 D 28 '14 Gas progress in the United States. R. C. Dawes. J Ind & Eng Chem 7:351-2 Ap '15 Present commercial gas situation in Texas. F. M. Lege, jr. Am Gas Light J 103:76-7 Ag 2 '15

Present practice in the sale of gas in the United Kingdom. F. W. Goodenough, Illum Engr 8:458-9 N '15

Report of industrial fuel committee, National commercial gas association. H: O. Loebell, Am Gas Light J 102:3-4 Ja 4 '15

Report of the committee on new business; lowa district gas association. Am Gas Light J 163:133 Ag 30 '15

Report of the committee on piping large buildings for gas. il Am Gas Inst Pro 9:pt 2, 1338-1489; Discussion. 1490-1511 '14

Three ways of spending money to make money in the gas business. H. B. Maynard; H. C. Blackwell; G. W. Clabaugh. Am Gas Light J 103:34-5 Jl 19 '15

See also Gas appliances; Gas companies; Gas lighting; Gas power plants; Gas safety

#### Gas industry-Continued

#### Advertising

Correcting misleading statements. Am Gas Light J 103:36-7 Jl 19 '15 Direct advertising in the gas business. A. R. Fernald. Am Gas Light J 102:198-9+ Mr

Report of committee on publicity, National commercial gas association. Am Gas Light J 101:380-1 D 14 '14 Value of window display. Am Gas Light J 103:52-4 Jl 26 '15

#### Exhibitions

Exposition awards. Am Gas Light J 103:109

Ag 16 '15 Gas show at Washington, diags Am Gas Light J 103:171-2 S 13 '15

#### Statistics

Address to the Southern gas association. S. E. DeFrese. Am Gas Light J 102:385-7 Je 21 '15 Gas lamps

Construction of the radio-X lamp, il Am Gas Light J 103:118 Ag 23 '15

Gas and oil lamps and appurtenances; committee report. Illum Eng Soc 10:517-20 no 7 '15; Same. Illum Engr 8:409-11 O '15; Same. Am Gas Light J 103:273 N 1 '15

Gas lamps and appurtenances. Illum Engr 7: 511-13 N '14

Gas street lighting development. F. R. Hutchinson, il Am Gas Light J 102:356-8 Je 7 '15

New radio-X lamp. il Am Gas Light J 103:60

Jl 26 '15

Photometry of incandescent lamps. J. W

Photometry hotometry of incandescent lamps. J. W. Roper, diags Am Gas Light J 102:178-5 Mr

Physical installation of gas arcs. C. A. Luther. il Am Gas Inst Pro 9:pt 1, 876-91; Discussion. 892-902 '14

Pilot flame ignition of incandescent gas lamps. C. W. Jordan, diags Am Gas Light J 103: 214-15 O 4 '15

See also Gas fixtures; Gas lighting; Gas mantles

## Gas laws. See Gas-Standards

### Gas lighting

ias laws. See Gas—Standards
ias lighting
Coal gas candle power. L. J. Willien. Am Gas
Light J 102:219-20 Ap 5 '15; Same. Metal
Work 83:537-8 Ap 9 '15
Converting night into day; what the inventor
has done for oil, gas, and electricity in illumination. il Sci Am 112:535-6 Je 5 '15
Domestic lighting. J. D. Shattuck. Am Gas
Light J 103:250-1 O 18 '15
Examples of modern factory lighting by gas.
il Illum Engr 8:339-42 Ag '15
Factory lighting by high pressure gas. A. E.
Broadberry. il Illum Engr 8:199-202 My '15
Future of gas lighting. E. D. Brewer. Am Gas
Light J 102:402 Je 28 '15
Gas lighting at the Panama-Pacific international exposition. C. B. Babcock. il Am Gas
Light J 102:334-5 Ap 12 '15
Good lighting gives prestige to the product.
H. T. Owens. il Am Gas Light J 102:209-10
Ap 5 '15
House maintenance of gas lighting. W: O.
Weekes. Am Gas Light J 103:203-5 S 27 '15
House maintenance service. A. Hewitt. Am
Gas Light J 102:39, 42-3 Ja 18 '15
Lighting week—a successful gas show—Jersey
City, N. J. H. T. Owens. il Am Gas Light
J 103:252-3 O 18 '15
Office and store lighting by gas. T: Scofield
and O. H. Fogr Am Gas Light J 103:299-

Office and store lighting by gas. T: Scofield and O. H. Fogg. Am Gas Light J 103:299-300 N 8 '15

Piping houses for gas lighting. H. R. Sterrett. Am Gas Light J 102:87, 90 F 8 '15; Same. Illum Eng Soc 10:296-302 no 4 '15

Popular talk on semi-indirect lighting. R. F. Pierce, il diags Am Gas Light J 102:369-72 Pierce, i Je 14 '15

Recent advances in indoor gas lighting. C. W. Jordan. il diags Illum Eng Soc 9:873-94 no

Report of N. C. G. A. committee on indoor lighting. il Am Gas Light J 102:82-7 F 8 '15 Report of N. C. G. A. committee on outdoor gas lighting. il Am Gas Light J 102: 117-19 F 22 '15

Residence lighting with special reference to semi-indirect illumination, R, F, Pierce. Am Gas Light J 102:322-3 My 24 '15 Two up-to-date high-pressure gas installa-tions, il Illum Engr 7:574-5 D '14

See also Gas; Gas companies; Gas fixtures; Gas lamps; Gas mantles; Gas meters

## Cost

Comparative costs of gas and electricity for illuminating purposes, B. K. Cash. Am Gas Light J 102:167+ Mr 15 '15 Gas and electric street lights; comparison of cost and efficiency, il Munic Eng 49:96-8 S

Holyoke gas and electricity. Munic J 38:258 F 25 '15

F 25 '15

Report of committee on piping large buildings for gas; economical comparison of gas and electric lighting operating indoors. Am Gas Inst Pro 9:pt 2, 1431-9 '14

## lanition

### See Gas-Ignition

Gas lighting, Incandescent Developments in incandescent gas lighting; with discussion. R. F. Pierce, il Illum Eng Soc 9:961-73 no 9 '14

#### Gas lighting week

National gas lighting week, Sept. 27 to Oct. 2 1915. il Am Gas Light J 103:145-8 S 6 '15

#### Gas mantles

as mantles
Chemistry of the incandescent gas mantle.
H. S. Miner. Met & Chem Eng 13:50-2 Ja
'15; Same. Am Gas Light J 102:65-6 F 1
'15; Same. Sci Am S 79:139 F 27 '15
Contributions of the chemist to the incandescent gas mantle industry. S. Mason. J
Ind & Eng Chem 7:279-80 Ap '15
Evolution of the Welsbach mantle. Sci Am
112:535-6 Je 5 '15

Plant to manufacture 1,000 gas mantles daily.
il Textile World 49:360-1 Je '15
Recent advances in indoor gas lighting. C. W.
Jordan. il diags Illum Eng Soc 9:874-9 no 14

Visit to some of the leading incandescent mantle works round London, il Illum Engr 7:569-72 D'14

## Gas manufacture and works

Application of by-product coke ovens to the gas industry. J. D. Forrest. Am Gas Light J 102:186-9 Mr 22 '15 Carbonization in bulk—Koppers' ovens. C. J. Ramsburg, if diag Am Gas Inst Pro 9:pt 1, 543-601; Discussion. 9:pt 1, 601-14 '14 Catalysis in the gas industry. Sci Am S 79: 125 F 20 '15 Catalytic agents; their relation to modern methods. Sci Am S 80:53 Jl 24 '15 Catalytic agents; their relation to modern methods. Sci Am S 80:53 Jl 24 '15 Catalytic agents; their relation to modern methods. Sci Am Gas Inst Pro 9:pt 1, 340-61 '14; Same cond. Am Gas Light J 101:305-9 N 16 '14; Same cond. Met & Chem Eng 12: 696-702 N '14; Same cond. Sci Am S 80:316-19 N 13 '15; Discussion. Am Gas Inst Pro 9: pt 1, 361-7 '14 Coke in gas producers. Iron Age 96:464 Ag 26 '15; Same. Am Gas Light J 103:186 S 20 '15 Determination of Prussian blue in washer sludge and spent oxide. Am Gas Light J 103:151 S 6 '15 Experience with a by-product coke oven plant. C. C. Boardman, il Am Gas Light J

Experience with a by-product coke oven plant. C. C. Boardman, if Am Gas Light J 102;289-94 My 10 '15 Gas from sawdust, J Ind & Eng Chem 7:542-3 Je '15

Je '15
Gas manufacture from the point of view of physical chemistry. W. F. Rittman. Am Gas Inst Pro 9:pt 1, 288-300 '14; Same cond. Am Gas Light J 101:395-7 D 21 '14; Same cond. J Ind & Eng Chem 6:1027-30 D '14; Summary. Met & Chem Eng 12:678 N '14; Discussion. Am Gas Inst Pro 9:pt 1, 300-4 '14
Gas producers with by-product recovery. A. H. Lymn. il diags Am Soc M E J 37:253-66 My '15

Ideal retort: electrical carbonization of coal. H. F. Boughton, diags Am Gas Light J 102: 315-16 My 17 '15 Improved Jones oil gas process at the Potrero gas works, San Francisco. E. C. Jones and L. B. Jones. il diag Am Gas Light J 103:23, 26-7 Jl 12 '15

Gas manufacture and works-Continued

Mode of decomposition of coal by heat. H. C.
Porter and G. B. Taylor, diags Am Gas Inst
Pro 9:pt 1, 234-83; Discussion. 9:pt 1, 283-8

New coal gas installation at Fall River. C. W. Hunter, il plan Am Gas Light J 102:145-9 Mr 8 '15; Discussion (Carbonization in New England). 102:362-5 Je 7 '15

England). 102:362-5 Je 7 '15 ew method of utilizing lignite coal tar; ab-stract. V: Schon. Am Soc M E J 37:403-4 JI

'15'
Possible economies from the use of exhaust steam in a water gas plant. S. A. Reinhard and C. A. Schnerr, il plan Am Gas Light J 102:225-30 Ap 12 '15'
Recovery of toluene from gas. diags J Ind & Eng Chem 7:438-9 My '15'
Report of the committee on progress in carbonization methods. il diags Am Gas Inst Pro 9:pt 1, 450-539; Discussion. 9:pt 1, 539-43' '14'

Tall reinforced concrete coke house in Rotter-dam, Holland. il Eng & Contr 44:229-30 S 22 '15

22 '15
Time factor in making oil gas. M. C. Whitaker
and C. M. Alexander, diags J Ind & Eng
Chem 7:484-95 Je '15
Up-keep of mechanical units in large gas
plants. C. A. Jefferis. Am Gas Light J 103:
211-12 O 4 '15
Value of mechanical or other indicating and

recording appliances in the operations of a gas plant, W. Philpot. Am Gas Light J 103: 298-9 N 8 '15

See also Gas—Standards; Gas, Oil; Gas, Water; Gas companies; Gas power plants; Gas producers; Gas purification; Gas retorts; Gas testing; Gasholders

#### Accidents

Hazards of gas works. J. B. Douglas. Am Gas Light J 103:327, 330 N 22 '15

Bibliography

Bibliography of the chemistry of gas manufacture. W. F. Rittman and M. C. Whitaker. U S Bur Mines Tech Pa 120:1-21 '15

Safety devices and measures

Report of committee on accident prevention. Am Gas Inst Pro 9:pt 1, 82-110; Discussion. 9:pt 1, 111-20 '14

See also Gas safety code

Gas manufacture and works, Municipal
Kalamazoo situation. W: Newbigging. Am Gas
Light J 103:38-9 Jl 19 '15
Municipal gas plant of St. Petersburg, Florida.
il Munic Eng 48:240-1 Ap '15
St. Petersburg, Florida, gas plant. il Am Gas
Light J 102:241-2 Ap 19 '15

Gas measurement
Measurement of gas in large volumes. J. F.
Wing, diag Am Gas Light J 102:4-7+ Ja 4

Measuring gas weights. T: E. Butterfield. Am Soc M E J 37:443-5 Ag '15 Measuring the gas supplied to Panama-Pacific exposition. il Am Gas Light J 103:258 O 25

Report of the committee on measurement gas in large volumes. diag Am Gas Inst Pro 9:pt 1, 677-704; Discussion. 9:pt 1, 705-20 '14 See also Gas flow; Gas meters; Manometers

meters

1877 instructions for reading meters. Am Gas

istallation repairing and testing of meters by a small company. C: Otten, jr. il Am Gas Inst Pro 9:pt 2, 1184-1205; Discussion. 9:pt 2, 1205-42 '14 Installation

Measurements for the household, il U S Bur Stand Circ 55:91-101 '15

Prepayment meter in the South, M. A. lin. Am Gas Light J 103:11-13 Jl 5 '15

Gas pipe lines

ngineering problems arising in the transportation of natural gas. J. P. Fisher. Am Soc M E J 37:374-7 Jl '15

Gas pipes

as piping practice in eastern city. H. Sterrett. Metal Work 83:347-8 Mr 5 '15

Installation and maintenance of services, R. B.

Installation and maintenance of services. R. B. Duncan. il diags Am Gas Inst Pro 9:pt 2, 1052-1161; Discussion. 9:pt 2, 1161-82 '14 Lead wool as jointing material; abstracts. C. E. Reinicker. il Am Gas Light J 102:242-6 Ap 19 '15; Eng & Contr 43:520-2 Je 9 '15 Moving a 30-in. gas main. R. J. Van Wagner. il Eng N 74:1082 D 2 '15 Oxy-acetylene welding eliminates joints in gas mains; with cost figures. il Eng Rec 71:182 F 6 '15

T1:182 F 6 '15
Present practice of gas distribution by British undertakings. W. Hole. il diags Am Gas Light J 103:305-9, 326 N 15-22 '15
Proper specifications for and inspection of interior gas piping. A. E. Turner. Am Gas Inst Pro 9:pt 2, 1311-26 '14; Same (Standardizing gas piping specifications). Metal Work 82:764-7 D 11 '14; Discussion. Am Gas Inst Pro 9:pt 2, 1327-37 '14
Report of committee on distribution, Iowa district gas association. Am Gas Light J 102:403 Je 28 '15
Sizes and equivalent length of services. J. M. Spitzglass. Am Gas Light J 103:337-9 N 29
Sizes of pipes for high pressure gas mains

'15
Sizes of pipes for high pressure gas mains.
J. M. Spitzglass, il diags Am Gas Light J
102:49-52 Ja 25 '15
Welding of high pressure mains. J. D. Shattuck, il diags Am Gas Inst Pro 9:pt 2, 9451011 '14; Same abr. Am Gas Light J 102:54-5,
58-60, 66-9 Ja 25-F 1 '15; Discussion. Am
Gas Inst Pro 9:pt 2, 1011-52 '14
Welding the joints of steel gas mains. il Eng
N 73:233-4 F 4 '15

See also Gas distribution; Gas pipe lines Gas plants. See Gas manufacture and works

Gas power plants

British producer-gas and ammonia-recovery plant, diags Met & Chem Eng 13:456-8 Jl '15 Gas engines replace a steam turbine power plant. C. L. Follmer, il plan Power 42:670-4 N 16 '15

Gas-power plant of the Illinois glass co. at Alton, T: Wilson, il plan Power 42:252-6 Ag

Gas producers and concentration of power at mines. R. H. Fernald. Colliery 35:415-17 Mr

Gas producers with by-product recovery. A. H. Lymn, il diags Am Soc M E J 37:253-66 My

'15
Investigation of the gas-producer power-plants in New York city and vicinity. C. M. Ripley.
Am Soc M E J 37:683-9; Discussion. 37:689-91 D '15; Abstract. Power 42:808-9 D 7 '15
Modern gas-power blower stations. A. West. il diags Am Inst Min E Bul 102:1205-13 Je '15; Abstract. Am Soc M E J 37:413 Jl '15
Test of 200-hp. gas-producer plant. F. V. Larkin. Power 41:6-7 Ja 5 '15

See also Blast furnace gas; Coke oven gas; Gas and oil engines; Gas producers

Gas producers

British producer-gas and ammonia-recovery plant, diags Met & Chem Eng 13:456-8 Jl '15 Cas producers and concentration of power at mines. R. H. Fernald, Colliery 35:415-17 Mr

Gas producers with by-product recovery, A. H. Lymn, il diags Am Soc M E J 37:253-66 My

asification of rough lignite; abstract. R. Klostermann. Am Soc M E J 37:182 Mr '15 Gasification

Important advance in gas producer efficiency. il Met & Chem Eng 13:399-400 Je '15

Investigation of the gas-producer power-plants in New York city and vicinity. C. M. Ripley. Am Soc M E J 37:683-9; Discussion. 37:689-91 D '15; Abstract. Power 42:808-9 D 7 '15

Morgan producer gas machine. il Iron Age 95: 1161-3 My 27 '15; Iron Tr R 57:180-3 Jl 22 '15

Power with by-product recovery. T. R. Wollaston. Engineer 119:326-7 Ap 2 '15; Same. Sc. Am S 80:42-3 Jl 17 '15

Progress in gas producer efficiency, il Eng 1/49:sup1-2 Je '15

Sub-hituminous coal and sawmill waste in producer plant. G: S. Wilson, il Power 42 442-3 S 28 '15

Gas producers—Continued

Test of 200-hp, gas-producer plant. F. V.

Larkin, Power 41:6-7 Ja 5 '15

Gas pumps. See Pumps. Gas

Gas purification

Different kinds of oxide. Am Gas Light J 103: 132 Ag 30 '15

132 Ag 30 '15
Electrical process for detarring gas. F. W.
Steere, il diag Met & Chem Eng 12:775-8 D
'14; Same. Am Gas Inst Pro 9:pt 1, 178-89
'14; Same cond. Eng N 72:1007 N 19 '14;
Same cond. Eng M 48:736-9 F '15; Discussion. Am Gas Inst Pro 9:pt 1, 18:1-39 '11
Filtering producer gas. C. A. Tuppet. fron
Age 95:155-6 F 25 '15

Age 95:155-6 F 25-75
Fractional collection of crude tar, G. T. Purves, diags Am Gas Light J 102:387-90 Je 21 '15
Gas purification with carbonate of potash. Am Gas Light J 103:317 N 15-75
Purifier installations, C. E. Paige, il Am Gas Inst Pro 9:pt 1, 721-50; Discussion, 9:pt 1, 750-62 '14

tou-52'14
Purifying producer gas; the use of hydrated iron oxide for the removal of sulphur. A. J. Wallace. Iron Age 95:896-7 Ap 22'15
Removal of carbon bisulphide from coal-gas. E. V. Evans. diag Met & Chem Eng 13:239-40 Ap '15

See also Gas cleaning

# Gas ranges, See Gas stoves

Gas rates

Cost and price of gas in a small city. W: C. Butterworth. Am Gas Light J 102:180-3 Mr

Des Moines gas company case. Elec R & W Elec'n 67:329-30 Ag 21 '15
Gas rates. J. H. Maxon. Am Gas Light J 102: 203-4 Mr 29 '15
Industrial rate based on maximum demand. Am Gas Light J 102:283 My 3 '15
Kalamazoo situation. W: Newbigging. Am Gas Light J 103:38-9 Jl 19 '15
Logical gas rates. A. S. Ives. Am Gas Light J 103:22 Jl 12 '15
National commercial gas association report of committee on differential rates. F. W. Frueauff. Am Gas Light J 102:18-23+ Ja 11 '15
Northampton, Mass., rate case. Am Gas Light Northampton, Mass., rate case. Am Gas Light

J 102:154-5 Mr × 15 Report of committee on rates, Am Gas Inst Pro 9:pt 2, 1758-60; Discussion. 9:pt 2, 1760-81 '14

Southwestern electrical and gas association 11th annual convention. Am Gas Light J 102: 378-9 Je 14 '15 Specific examples of the benefits from scien-tific rates. H. L. Coleman. Am Gas Light J 101:362-4 D 7 '14

Gas retorts

ias retorts
Ideal retort; electrical carbonization of coal.

H. F. Boughton, diags Am Gas Light J 102:
315-16 My 17 '15
Inclined retorts, R. B. Richardson, il diag Am
Gas Light J 102:306-7 My 17 '15
Operation of inclined retorts, F. Huber, il Am
Gas Inst Pro 9:pt 1, 406-33 '14; Same cond.
Am Gas Light J 102:102-3, 106-8 F 15 '15;
Discussion, Am Gas Inst Pro 9:pt 1, 433-50
'14

Report of the committee on progress in carbonization methods. il diags Am Gas Inst Pro 9:pt 1, 450-539; Discussion. 9:pt 1, 539-43

See also Gas manufacture and works

Gas safety code
Gas safety code of the Bureau of standards.
R. S. McBride. Am Gas Light J 103:44-5 Jl
19 '15

Gas sampling

as sampling
Flue-gas collector. C. H. Bean. diag Power 42:
763 N 30 '15
Flue-gas collector. F. W. Fischer. diag Power
42:489-90 O 5 '15
Sampling for average gas. Am Gas Light J
102:317 My 17 '15

Gas stoves

Gas range efficiencies. Am Gas Light J 102: 269 Ap 26 '15 Gas range week, il Am Gas Light J 102:257-62 Ap 26 '15 Rented gas ranges. Am Gas Light J 102:326-7 My 24 '15

Standardization of gas appliance specifications. Am Gas Light J 1021140-1 Mr 1 '15 What policy is being adopted by gas companies to meet electric stove competition? V. S. McIntyre. Am Gas Light J 103:220 O 4 '15

4 '15

Gas testing

British thermal unit losses on medium pressure line. W. O. Brewer. Am Gas Light J 102:220-1 Ap 5 '15; Discussion. 102:327, 330-1 My 24 '15

Coal gas candle power. L. J. Willien. Am Gas Light J 102:219-20 Ap 5 '15; Same. Metal Work 83:537-8 Ap 9 '15

Composition of gas in relation to the performance of the bunsen burner. R. F. Pierce. Am Gas Light J 103:1-5 J1 5 '15

Efficiency relation existing between various Argand and open flame test burners. F. H. Gilpin. diags Am Gas Inst Pro 9:pt 1, 379-401; Discussion. 9:pt 1, 401-4 '14

Gas testing ordinances: coming of calorimetry. J. Abady. il Am Gas Light J 101:369-71 D 14 '14 Instruments for testing gas M. L. Harvits

14 '14
Instruments for testing gas. M. L. Hamlin.
diags J Ind & Eng Chem 6:1032-3 D '14
Lead acetate test for hydrogen sulphide in
gas. R. S. McBride and J. D. Edwards.
diags pls U S Bur Stand Tech Pa 41:1-46
'14; Abstract. J Fr Inst 178:639-42 N '14;
Abstract. Met & Chem Eng 13:62 Ja '15
London gas referees' regulations for determining calorific power. diag Am Gas Light
J 102:213-15 Ap 5 '15
Standards for gas service. U S Bur Stand Circ
32:1-190 '15
Tests of a new recording calorimeter. C. H.

32:1-190 '15 Tests of a new recording calorimeter. C. H. Stone and W. H. Hinman. Am Gas Inst Pro 9:pt 1, 200-10 '14; Same. Am Gas Light J 101:387-90 D 21 '14; Discussion. Am Gas Inst Pro 9:pt 1, 210-17 '14

See also Gas sampling

Gas tractors

Gas-tractor power plant. C. V. Hull. il plan Power 41:226-8 F 16 '15

turbines

as turonnes. Discussion of the question of the gas turbine; abstract. A. Walter. diag Am Soc M E J 37:603-4 O '15 Gas turbine. S. F. Walker. Colliery 36:26-8 Ag

Gas turbines brought to practical efficiency. C. A. Tupper. Iron Age 96:185 Jl 22 '15; Same. Sci Am S 80:210 O 2 '15 Internal combustion turbine. il Am Gas Light J 102:324-5 My 24 '15

Gas washing. See Gas cleaning

Gas water heaters

Hotstream water heater, il Dom Eng 72:271 Ag 28'15

Mater heating by gas. C. E. Bartlett. Am Gas Light J 102:310-11, 314-15 My 17 '15 What some makers of water heaters are offering the gas company. il Am Gas Light J 102:337-43, 346-8 My 31 '15

Gas wells. See Gas, Natural

Gases

Chemical reactions at low pressures. I. Langmuir. Am Chem Soc J 37:1139-67 My '15; Abstract. J Ind & Eng Chem 7:349-51 Ap '15; Abstract. Met & Chem Eng 13:244-6 Ap '15 Hydrogen and the rare gases, J. Dewar. Sci

Method for calculating that part of the recoil momentum of a gun which is due to the action of the gases after the projectile leaves the muzzle. W: S. Franklin. J Fr Inst 179: the muzzle. W: S. Franklin 559-77 My '15 Physical laws of methane gas Am Soc M E J 37:176-9 Mr

P. F. Walker.

Vapor pressure of ethane and ethylene at temperatures below their normal boiling points. G. A. Burrell and J. W. Robertson. diags Am Chem Soc J 37:1893-1902 Ag '15

See also Air; Blast furnace gas; Coke oven gas; Firedamp; Flue gas; Gas; Gas and oil engines; Hydrogen; Inflammable mixtures; Ionization; Mine gases; Nitrogen; Oxygen; Ozone; Sewer gas

Analysis

Sce Gas analysis

ases, Asphyxiating Combating poisonous gases; abstracts. P. Pas-cal. diag. Eng. M. 50:114-16. O. '15; Engineer 119:598 Je 18 '15 Dispersing asphyxiating gases. il Sci Am 113:

Modern munitions of war. V. Lewes. Engineer 120:82-3 Jl 23 '15 Poisonous gases and incendiary bombs. Ry R 57:375-6 S 18 '15

57:375-6 S 18 15
 Poisonous gases in warfare. W. A. Tilden.
 Eng M 49:739 Ag '15
 Use of poisonous gases in warfare. J: B. C.
 Kershaw. il Sci Am 112:595+ Je 12 '15

Gases, Kinetic theory of Kinetic theory of gases, S. Dushma Elec R 18:952-8, 1042-9, 1159-68 O-D Dushman.

asholders
Care and maintenance of gas holders. J. H.
Braine. il Am Gas Inst Pro 9:pt 1, 762-840
'14; Same cond. Am Gas Light J 101:355-9+,
272-5, 378-80 D 7-14 '14; Discussion. Am Gas
Inst Pro 9:pt 1, 840-75 '14
Concrete pile holder foundation at Lynn. F. E.
Drake. il diags Am Gas Light J 102:163-6
Mr 15 '15; Discussion, 102:235-7 Ap 12 '15
Gasholder without a water tank. diag J Ind &
Eng Chem 7:802 S '15
Novel design in gas holders. J Fr Inst 180:636
N '15

'15

Gasol. See Acetylene, Substitutes for

Gasoline

asoline
Absorption of gasoline vapor in natural gas
by fuming sulfuric acid. R. P. Anderson
and C. J. Engelder. J Ind & Eng Chem 6:98992 D '14
Analy is and valuation of motor fuels 11
methods for examining them; from German
data. Automobile 33:202-5, 247-9+ Jl 29-Ag
5.15

b '15
Burton process of cracking to make gasoline.
C. H. Claudy. il Sci Am 112:5+ Ja 2 '15
Camphor in gasoline improves its quality. E. M.
Keating. Inland Ptr 56:383-4 D '15
Cars, oil production and the price of gasoline.
il Horseless Age 36:255-7 S 15 '15
Chemict as a fruct buster. Sci Am 112:284
Mr 27 '15
Condensation of gasoline from natural gas

Mr 27 '15
Condensation of gasoline from natural gas. G: A. Burrell, F. M. Seibert and G. G. Oberfell. diags pls U S Bur Mines Bul 88:3-100 '15; Excerpts. Automobile 33:92 Jl 8 '15
Determination of gasoline vapor in air. G. A. Burrell and I. W. Robertson. diag J Ind & Eng Chem 7:112-13 F '15
Dr. Rittman's gasoline process. Sci Am 112: 248 Mr 13 '15; Same. Horseless Age 35:285+ Mr 3 '15

Experiments show action of mixtures of air and gasoline vapor. H. S. Webb. Automobile

3.3 doi:11 Mr 18 '15 Gasoline from natural gas. F. E. Matthews. Power 42:677-8 N 16 '15 Gasoline from Anthetic crude oil. W. O. Snelling, Am Inst Min E Bul 100:695-704 Ap '15, Same cord Am S 79:180-91 Mr 20 '15; Same cord, Sci. Am 112:266-7 Ar 20 '15; Abstract, Mct & Chem Eng 13:180-1 Mr '15; Discussion, Am Inst Min E Bul 101:1163-9 Mr '15.

My '15 Gasoline from synthetic oil. W. O. Snelling. Eng & Min J 99:379 F 20 '15; Same. Am Gas

Light J 10 11 15 15 15 Handling gasoline. Munic J 39:315-16 Ag 26

Improvement of high boiling petroleum oils, and the manufacture of gasoline as a byproduct therefrom, by the action of aluminam chloride. A standard of the Area of the Area of the Eng 13:592-7 S is Same abr. Am Gas Light J 103:293-5+ N 8 '15; Abstract. Eng N 74:532 S 16 '15

Increased gasoline yield and toluol from petroleum. Am Gas Light J 102:156-7 Mr 8 '15

Inflammability of mixtures of gasoline vapor and air, G. A. Burrell and H. T. Boyd, diags U S Bur Mines Tech Pa 115:1-16 '15; Same cond. J Ind & Eng Chem 7:414-17 My '15; Summary. Met & Chem Eng 13:802 N 1 '15 Innovations in petroleum technology, Eng M 49:111-12 Ap '15

Manufacture of gasoline by cracking heavy oils. Sci Am S 79:283 My I '15 Motor fuels; situation in England, and on the continent. V. B. Lewes. Am Gas Light J 103:165-7, 170-1, 178-81 S 13-20 '15 Preparation of gasoline and kerosene from heavier hydrocarbons. B: T. Brooks and others. diags J Ind & Eng Chem 7:180-5

Rittman process of cracking, C. H. Claudy, il Sci Am 112:267 Mr 20 '15 Rittman processes, Horseless Age 36:368 O 15

Rittman vaporizes petroleum in still. diag Automobile 32:555 Mr 25 '15
Statistical review of the question of gasoline supply. B: T. Brooks. J Ind & Eng Chem 7:176-9 Mr '15
Storage and handling of gasoline in the garage. H. T. Wade. il Sci Am 112:12-13 Ja 2 '15
Thermal reactions of petroleum hydrocarbons in the vapor phase. W. F. Rittman. J Ind & Eng Chem 7:945-53 N '15
Two new fuel processes discovered. Automobile 32:427 Mr 1 '15
Weight of a gallon of gasoline. Automobile 33:200 Jl 29 '15

#### Storage

Sec Oil storage

Gasoline, Substitutes for

Abandon manufacture of new fuel zoline. Horseless Age 34:927 D 30 '14 Natalite a gasoline substitute. Automobile 32:1094 Je 17 '15

Gasoline engines. See Gas and oil engines

Gasoline in sewers

asoline in sewers

Apparatus for testing sewer atmosphere for explosive gases. H: J. Kellogg. diag Eng & Contr 42:273 S 16 '14

Inflammable wastes in sewers. N. S. Sprague. diags Munic Eng 47:336-43 N '14; Same. Eng & Contr 42:476-8 N 18 '14; Excerpt. Eng Rec 70:442-3 O 17 '14

Investigation of sewer air following Boston explosion, H. W. Clark, Eng Rec 70:606-7 D 5 '14

uantity of gasoline necessary to produce explosive mixtures in sewers. G. A. Burrell and H. T. Boyd. diags J Ind & Eng Chem 7:750-4 S '15; Abstract. Eng N 74:955 N 11 '15

Gasoline shovels. See Shoveling machines Gasoline tractor. See Tractors

Gate posts

Gate and posts, Baldwin-Lyman house, Salem, Mass., built in 1808; measured and drawn by G. Robb. Brickb 24:pl 10 N '15

Concrete headgate, south San Joaquin and Oakdale irrigation district in California. F. C. Scobey. diag Eng & Contr 43:383 Ap F. C. 28 '15

Mitering lock gate at Keokuk presents novel features, B. H. Parsons, il diags Eng Rec 72:344-9 S 18 '15

New type of gate for regulating adjacent water levels operates automatically, diags Eng Rec 71:304-5 Mr 6 '15

Repairs to the gates at the 70-foot entrance to the Tyne docks. il Engineer 120:412, 418 O 29 '15

Wicket gates the logical development for hydraulic turbine regulation, L; F. Moody, diags Eng Rec 72:358-60 S 18 '15

See also Floodgates

Construction of a covered gateway, diags Bldg Age 37:63-4 D '15 Gateways

Design for attractive entrance gateway, il Bldg

Age 37:61-2 My '15
Dudley memorial gate, Harvard university;
views. Brickb 24:255-6 O '15

Gatun dam

Credit for the Gatun dam. Sci Am 112:356 Ap 17 '15

Gatun dam; paper presented at meeting of Am. Soc. C. E., May 18, 1904. C. D. Ward. Sci Am S 79:247 Ap 17 '15

Gear cutting
Automatic bevel gear generator, il Iron Age
96:748-50 S 30 '15

Bevel gear roughing shaping machine, il Iron Age 95:399 F 18 45

Age 95:399 F 18 '15'
Electric alarm for bevel gear generator. E. K.
Morgan, diag Mach 22:232 N '15'
Fawcus herringbone gear hobbing machine, il
diag plan Mach 21:506-9 F '15'
Finding change gears for hobbing spiral gears,
G: W. Felton, Mach 21:905-7 Jl '15'
Fixture for milling spiral gears, R. A. Black,
diags Mach 21:918-19 Jl '15'
Flather automatic gear-cutter, il Mach 21:7623 My '15'
Glesson, havel gran placing.

Gleason bevel gear planing generator, il Mach 22:152-3 O'15

Gleason bevel gear planing generator, il Mach 22:152-3 O '15
Gleason 30-foot herringbone and spur gear planer, il diags Mach 21:503-5 F '15
Gould & Eberhardt turret-type ring gear roughing machine, il Mach 21:761-2 My '15
Hobbing small gears on the milling machine, diag Mach 21:406 Ja '15
Involute gear tooth forming device; simple method of laying out a templet or forming cutter, G. Luck, diags Mach 21:716-17 My '15
Machine for cutting bevel gears, il Iron Tr R

Machine for generating worm wheels, il Iron Age 96:751 S 30 '15 Making the spiral bevel gear, il Automobile 32:357-60 F 25 '15 Methods of chamfering gear teeth, diags Mach 21:495-6 F '15

21:495-6 F '15
Multiple spindle gear roughing machines at the Ford automobile shops. H. E. Eberhardt. Sibley J 29:88-9 D '14
Newton worm-wheel hobbing machine. il Mach 22:159 O '15; Ry Age (Mech ed) 89:597 N '15
Results obtained with ground hobs. E: K. Hammond. il diags Mach 21:695-700 My '15
Turning, gashing and hobbing wormwheels. il diag Mach 21:999 Ag '15
Von Marchthal's system for verifying or replacing the division disks used for gear cutting. diags Automobile 32:236-7 F 4 '15

Gearing

Developments in the heat treatment of railway gearing; with discussion. W. H. Phillips. il Eng Soc W Pa 30:737-77 N '14; Abstract. Iron Tr R 55:1154 D 17 '14; Abstract. Am Soc M E J 37:237-8 Ap '15
Differential gears to eliminate rail corrugation. il diag Elec Ry J 46:26-7 Jl 3 '15
Effect of gear ratio on operating economy. Elec Ry J 46:88-70 Jl 10 '15
Gear diagrams: methods for the rapid solution of problems in gear design. H. D. Hess. Mach 22:131-4 O '15
Gearing for connecting high-speed machines to low-speed machines. Il Elec W 65:1476 Je 5 '15
Heat treatment of gears. Iron Age 96:629 S

Heat tr treatment of gears. Iron Age 96:629 S

Machines for Warner gear making. il Automobile 32:1129 Je 24 '15

Making small gear wheels with a molding machine. R. A. Miles. il diags Foundry 43: 161-2 Ap '15

New type of speed changing gear. il Iron Age 90:244 Jl 29 '15

Operating conditions of railway motor gears and pinions. A. A. Ross. il Gen Elec R 18: 249-58 Ap '15

Railway motor gearing. W. L. Allen. il Elec Ry J 45:1201-3; 46:111-12 Je 26, Jl 17 '15

Reduction gears on the Pennsylvania. il diags Int Marine Eng 20:339-40 Ag '15

Running tool steel pinions with soft steel gears: abstract. E. S. Sawtelle. Ind Eng 14:467 D '14

Strength of gear teeth. G. H. Marx and L. E.

Strength of gear teeth. G. H. Marx and L. E. Cutter. diag Am Soc M E J 37:637-45 N '15; Discussion. 37:704 D '15

Turbine speed reduction gear, il diags Engl-neer 120:315-16 O 1 '15 Turbo-reduction gear, il diag Power 41:887 Je 29 '15

se of continued fractions in mechanical problems. W: W. Johnson. il diag Mach 21: 802-4 Je '15 Use

See also Automobiles-Gearing; Chain gear; Gear cutting; Motor trucks-Gearing

Gearing, Bevel

Hardening bevel wheels by special machine. il diag Automobile 32:461 Mr 11 '15

Gearing, Helical

Planetary reduction gear. il Eng & Min J 100: 191-2 Jl 31 '15

Gearing, Herringbone

Fawcus herringbone gear hobbing machine. il diag plan Mach 21:506-9 F '15

Gearing, Spiral

earing, Spiral
Finding change gears for hobbing spiral
gears. G: W. Felton. Mach 21:905-7 Jl '15
Making the spiral bevel gear. il Automobile
32:357-60 F 25 '15
Spiral type bevel gears for automobile drives.
A. L. Stewart. Horseless Age 35:801-2 Je 16
'15; Discussion. Automobile 32:1110-11 Je 24
'15;

Gearing, Worm
Empirical worm-gear formulas. E. S. Hedstrom, Mach 21:724-6 My '15
Internal gear drive vs. worm drive. A. F. Mais. Horseless Age 35:852 Je 23 '15
Internal gear vs. worm truck drives. C. H. Taylor. Horseless Age 35:746 Je 2 '15
Internal vs. worm gears. A. F. Mais. Horseless Age 36:84 Jl 21 '15
Manufacture of worm gearing by a new process: a comparison of the straight and hourglas type of worms. C. T. Myers. il diags Horseless Age 35:116-21 Ja 20 '15
Worm drive for motor trucks. Horseless Age 35:441 Mr 31 '15
Worm drive vs. internal gear drive. C. C.

Worm drive vs. internal gear drive. C. C. Hancock. Horseless Age 35:650-1 My 12 '15 Worm gear efficiency. C. H. Calkins. il Horseless Age 34:982 D 30 '14

Gedney Farm hotel. See White Plains, N. Y .-Hotels

Gelatinizing agents

Concise group method for the detection of gelatinizing agents, pasty material and thickeners, used in food products. L. A. Congdon. J Ind & Eng Chem 7:606-7 Jl '15

#### Gems

#### Testing

Tables for the determination of gems and pre-cious or ornamental stones without injury to the specimen. A. J. Moses. Sch Mines Q 36:199-232 Ap '15

Genemotor

Genemotor; a self-starting and lighting system for Fords. il diag Horseless Age 35:537-8 Ap 21 '15; Same. Automobile 32:742 Ap 22 '15

Genemotor; a single unit starting and lighting system for moderate-priced automobiles. M. J. Fitch, il diags Gen Elec R 18:384-7 My

General electric company Annual report, 1914. Elec W 65:1031 Ap 24 '15 Safety and welfare work in an electrical plant. C. L. Lucas. il Mach 22:210-14 N '15

Generators, Electric. See Dynamos

## Geography

## Study and teaching

Table-top geography; hints on the construction of simple models. P. Collins. il Sci Am 112:270 Mr 20 '15

Geography and history
Problems of geographic influence. A. P. Brigham. Sci Am S 79:374; 80:10-11, 19, 38-9 Je 12, Jl 3-17 '15

Geological time
Birth-time of the world: methods of determining its age. J. Joly. Sci Am S 79:77-9 Ja 30
'15

Excursus xcursus on geological time. A. Harker. Sci Am S 80:118-19 Ag 21 '15

Sea-salt and geologic time, H. S. Shelton, Sci Am S 79:79-80 Ja 30 '15

Application of geology to the problems of the municipal engineer. H. Lapworth. Eng Contr 42:179-81 Ag 19'14

Economic geology, A. Knopf. Eng & Min J 99: 102-4 Ja 9 '15

Geology Continued
Geology in relation to the exact sciences, A.
Harto, Ser Am S 80:71 Jl 31 15
Origin of the Rocky mountains, S. J. Scholield, il Sei Am S 79:84 9 F 6 '15
Potassium salts; an economic geological study,
E. M. Heriot, il maps Eng & Min J 100:66972, 712-14 O 23-30 '15
War geology, W. Salomon, Sci Am S 80:267 O
23 '15

See also Asphalt; Clay; Coal; Earth; Earthquakes; Gas, Natural; Gypsum; Landslides; Metals; Mineral waters; Mines and mineral resources; Ore deposits; Petroleum; Phosphates; Rocks; Salt

Alaska

Geology of Juneau district, F: B. Hyder, Eng & Min J 99:901-2 My 22 '15

Alberta

Correlation and geological structure of the Alberta oil fields. D. B. Dowling, map Am Inst Min E Bul 102:1355-64 Je '15

Geology and ore deposits of Red Cliff, Colorado. A. H. Means. Econ Geol 10:1-11 Ja '15 Orés of Gilpin county, Colorado. E. S. Bastin. il Econ Geol 10:262-91 Ap '15

Connecticut

Sulphide-bearing rocks from Litchfield, Conn. E. Howe, diags Econ Geol 10:330-47 Je '15

Cuba

Geology of the iron-ore deposits in and near Daiquiri. J. F. Kemp. it diags map Am Inst Man 11 B at 16 at 15 at 15. Iron deposits of Daiquiri, Cuba. W. Lindgren and C. P. Roy and Grading it Am Inst Min E Bul 106:2171-90 O '15

Ancient sedimentary iron ores of British India. C. M. Weld, maps Econ Geol 10:435-52 Jl '15

Kentucky

Harlan, Ky., coal field. W. R. Peck. Colliery 35:649-55 Jl '15 Kongo

Economic geology of the Belgian Congo, Central Africa. S. H. Ball and M. K. Shaler. il map Econ Geol 9:605-63 O '14; Excepts. Eng & Min J '99:441, 608-11 Mr 6, Ap 3 '15

Mexico

Furbero oil field, Mexico. E. Degolyer, il map Mexican oil fields. L. G. Huntley, il maps Am Inst Min E Bul 105:2899-1911 S '15 Mexican oil fields. L. G. Huntley, il maps Am Inst Min E Bul 105:2089-106 S '15 Oil region of northeastern Mexico. V. R. Gar-fias. bibliog Econ Geol 10:195-224 Ap '15

Boulder batholith of Montana. P. Billingsley. diags maps Am Inst Min E Bul 97:31-47 Ja '15; Discussion. 101:1128-37 My '15

Nevada

Goldfield and its present boom. H. C. Cutler. il Eng & Min J 99:221-4 Ja 30 '15

New Mexico

Geology of the Burro mountains copper district, New Merrick E. Somers, il maps Am Inst Min E Bul 101:957-96 My '15; Discussion, 108:2476 D '15

Oklahoma

Sce also Petroleum-Oklahoma

Quebec

Gold-bearing gravels of Beauce county, Que-bec. J. B. Tyrrell. Am Inst Min E Bul 99: 609-20 Mr '15

Sicily

Origin of the sulphur deposits of Sicily. W. F. Hunt. il Econ Geol 10:543-79 S '15

Sweden

Problems in iron ore geology in Sweden and in America. P. Geijer. il Econ Geol 10:299-329 Je '15

Tennessee

Geological anatomy of a Tennessee zinc mine, F. L. Nason, diags Eng & Min J 100:259-62 Ag 14 '15 Zinc deposits of eastern Tennessee, F. L. Nason, Eng & Min J 99:734-6 Ap 24 '15

Htah

Geology of the ore deposits of the Tintic mining district. G. W. Crane. Am Inst Min E Bul 106:2147-60 O '15; Same cond. Eng & Min J 109:753-7 N 6 '15.

Processes of mineralization and enrichment

Processes of mineralization and enrichment in the Tintic mining district. W. Lindgren. 2 pt. Econ Geof 10:225-40 Ap. 15 Relation of ore deposits to different types of intrusive bodies in Utah. B. S. Butler, map Econ Geof 10:101-22 F '15

Virginia

Oriskany iron ores of Virginia, C. M. Weld. maps Econ Geol 10:399-421 Jl '15

Washington

Petrology and economic geology of the Sky-komish basin, Washington, W. S. Smith, il map Sch Mines Q 36:154-85 Ja '15

Wisconsin

Wisconsin zinc district. H. C. George, il maps Eng & Min J 100:295-300 Ag 21 '15

Yellowstone national park

Geology of the Yellowstone national park. C. H. Butman. il Sci Am S 79:7-9 Ja 2 '15

Geometrical drawing
Geometrical constructions, K. D. McFarlane.
diags Mach 21:668-9 Ap '15

See also Mechanical drawing

Geometry

Sec also Geometrical drawing

Georgian architecture. See Architecture, Colonial German silver

erman silver German silver; melfing, casting and rolling, R. A. Wood, il Metal Ind n s 13:229-32, 322-3 Je, Ag '15 Metallography of German silver, F. C: Thomp-son, Met & Chem Eng 12:785-6 D '14

German science: abstract. Ind Eng 14:446 N Two points of view. Sci Am 113:422 N 13 '15 See also Railroads-Germany

Army

Foresters in the German army, T. R. Helms, il Am For 21:527-31 Ap '15 German army administration, O: von Gottberg, Sci Am S 80:363 D 4 '15

German post office and the German army. A. Gradenwitz. il Sci Am 113:25+ Jl 3 '15

Telegraph and telephone in the German army. il Sci Am S 80:177, 181 S 18 '15

Colonies

German colonies as outposts of science. Sci Am 111:450 D 5 '14

Commerce

Balance of trade in chemicals between the United States and Germany in 1913. J Ind & Eng Chem 6:1034-5 D '14

Germany's export trade; how the 1912 foreign business of \$30,000,000 was distributed. M. Braun. Automobile 31:1009-13+ D 3 '14 Hints for American exporters. F: Schreib-man. Eng M 49:662-71 Ag '15

Economic policy

German cartel policy. O: H. Luken. Eng M 48: 508-16 Ja '15

Food supply

Feeding the German nation in time of war. Sci Am 112:125 F 6 '15 Is Germany self-sustaining in war? B: Baker. Sci Am 111:460 D 5 '14

Industries and resources

Causes of Germany's industrial prosperity. H. H. Campbell, Eng M 48:801-7 Mr '15

Germany -Industries Continued

cermany -Industries Continued
Chemical industries of Germany, P. F. Frankland. Met & Chem Eng 13:378-87. Je '15: Same. Sci Am S 79:389-90, 402-3 Je 19-26 '15: Economic causes of the war traced to mushroom growth of German industries. H. Hauser. Automobile 33:382-5 Ag 26 '15: European textile industry. Textile World 49: 405-8 Jl '15: Future of Germany's steel industry. H. H. Campbell. Iron Age 96:188-9 Jl 22 '15: German agriculture in war time. Sci Am 112: 216 Mr 6 '15: German industrial competition—after the war. Engineer 119:245-6 Mr 12 '15: German system and method; effect of the war on her industries. Sci Am S 79:155 Mr 6 '15: Germany as nature's competitor. Sci Am 113: 442 N 20 '15
Is Germany self-sustaining in war? B: Baker. Sci Am 111:2460 D 5 '14
Tasks of German incentors in wartime. Sci Am 113:214+ S 4 '15
Textile trade in Germany. Textile World 48: 376-8 Ja '15
What Germany is doing in the chemical and metallurgical industries. Eng & Min J '99: 829 My 8 '15; Same cond. Sci Am S 80:5 Jl 3 '15

### Intellectual life

War and the scholars. Sci Am 112:488 My 29

#### Law

Commercial laws of England, Scotland, Germany and France. A. J. Wolfe and E. M. Borchard. U S Bur For & Dom Com 97:24-

#### Military aeronautics

Zeppelin question; facts and figures indicating the number and capacity of the air fleet. G. Prade. Sci Am S 79:214-15 Ap 3 '15

## Navy

Recent German naval construction, M. K. Barnett, il Sci Am 113:484+ D 4 '15 Von Tirpitz and his navy. Sci Am 113:334 O 16 '15

When the German fleet comes out. Sci Am 112:586 Je 12 '15

Gevsers

Apparatus to illustrate the action of geysers, il Sci Am 111:511 D 19 '14

Gibbons, Grinling, 1648-1721
Grinling Gibbons and the woodwork of his age. Review by R: F. Bach, Arch Rec 38: 189-90 Jl '15

Gibbs medal

Gibbs medal
Gibbs medal award to Arthur A. Noyes, W. D.
Harkins; J. Stieg!itz, J Ind & Eng Chem 7:
449-50 My '15
Gilpin county, Colorado
Ores of Gilpin county, Colorado. E. S. Bastin,
il Econ Geol 10:262-91 Ap '15

Ginpoles

Raising a gin pole. E: M. Keys, jr. diag Power 41:29 Ja 5'15
Tripod of 3-inch pipe sets arch centers in close quarters. il Eng Rec 71:277 F 27'15

Chart for designing reinforced concrete beams. R. R. Leffler. Eng & Contr 42:135-8 Ag 5 '14 Columns over clearways in Newark terminal. diag Eng N 74:991 N 18 '15

Design methods in concrete construction. J. Cochran. Concrete Cem 6:33-4, 83-5, 145-8 190-2 Ja-Ap '15

Design of beans, girders and trusses. E. Mc-Cullough, diags Bldg Age 36:27-8 JI; 33-4 Ag; 29-30 S; 37-9 O; 37-9 N; 27-9 D '14; 37:39-41 Ja; 31-3 F; 27-8 Mr; 49-50 Ap; 49-50 My; 47-8 Je; 45-6 JI; 27-8 Ag; 29-30 S; 37-8 N; 51-2 D '15

Design of rectangular concrete beams. H. Harding. Am Soc M E J 37:529-31 S '15

Design of reinforced concrete T-beams and rectangular beams with steel in compression.

M. J. Lorente. Eng & Contr 43:182-4 F 24 '15

Designing of reinforced concrete beams; some data tending to show errors in present theory and practice. L. J. Mensch. Eng & Contr 44:

Determining the stresses in an offset beam, W: L. Cathcart. Mach 21:672 Ap '15
Diagram for wooden beams. W. D. Hudson. Eng N 73:639 Ap 1 '15
Draw diagrams for beams reinforced for compression. W. W. Clifford and C. H. Mangold. Eng Rec 72:472 O 16 '15
Erecting 40-ton girders at a height of 250 feet above the street, il diags Eng Rec 70:699-702 D 26 '14
Erecting 36-ton girders with stool charge.

D 26 '14
Erecting 36-ton girders with steel shears, il
Eng Rec 70:606 D 5 '14
Field methods in concrete construction—beam
and slab forms, J. Cochran, diags Concrete
Cem 6:285-8+ Je '15
Graphical method for designing simple reinforced concrete beams and data for designing simple, double-reinforced and T-beams,
R. R. Leffler, Eng & Contr 43:239-42 Mr 17
'15
Heavy, plate girdery, in terms of the construction.

Heavy plate-girders in track-elevation work, il Eng N 73:1036-7 My 27 '15 Heavy trusses and foundation girders used in steel bank building, diags Eng Rec 71:713-14 Je 5 '15

Maximum E-50 shears and moments at points of short beams. W. M. Eliot, Eng Rec 72: 633 N 20 '15

633 N 20 '15

Maximum stresses in tension reinforcement.
M. J. Lorente. Eng & Contr 42:366 O 14 '14

Nomographic charts for simple beam design.
C: D. Conklin. jr. Eng Rec 71:809 Je 26 '15

Nomographic solutions for formulas of various types R. C. Strachan. Eng Rec 71:807-9 Je 26 '15

26 '15 Reinforcing spring in place holds concrete to plate girders, R. C. Hardman, diag Eng Rec 72:673 N 27 '15 Results of some tests of I-beam connections. C. S. Whitney, diags Eng & Contr 44:35-7 Jl 14 '15

Shear in beams, E. Jonson, Eng Rec 71:25 Ja.

Shear in beams. E. Jonson. Eng Rec 71:25 Ja 2 '15'
Shrinkage and time effects in reinforced concrete. F. R. McMillan. il Minn U Bul 3:1-41 '15; Abstracts. Eng Rec 72:251-2 Ag 28 '15; Eng & Contr 44:306-10 O 20 '15
Special methods of reinforced concrete design; with discussion. M. J. Lorente. diags Boston Soc C E J 2:265-82 S '15
Suspended beam forms—their advantages and disadvantages. S. Diamant. diag Eng Rec 71:120 Ja 23 '15
Tables for determining the bending moments and shears in simple beams and in beams fixed at one and both ends. S. M. Cotten. Eng & Contr 43:335-40 Ap 14 '15
Tests of I-beam connections made at Cornell. Eng Rec 71:746 Je 12 '15
Tests on the shearing resistance of reinforced concrete beams; abstract. E. Brown, H. M. MacKay and C. M. Morssen. Am Soc M E J 37:724 D '15
Torsion strength of reinforced concrete beams.

Torsion strength of reinforced concrete beams.

Am Soc M E J 37:49-50 Ja '15

See also Bridges; Building; Graphic statics; Roofs; Steel construction; Strains and stresses; Trusses

Biochemical systems and their function in the development of the organism. W. Bechterew. Sci Am S 79:131 F 27 '15

Therapeutic uses of preparations of the duct-less glands, R. G. Torrey. Sci Am S 80:122-3, 134-5 Ag 21-28 '15

Glare

Eye-sight vs. glaring lights and the fixture. F. L. Godinez. Arch & Bldg 46:479-80 D '14 Glare as a factor in street lighting. A. J. Sweet. Elec R & W Elec'n 66:439-43 Mr 6

Glare in museum galleries; the psychological factor in the lighting problem. B; I. Gilman, diags Arch Rec 38:262-80, 362-78 Ag-8 '15

In the glare, F. L. Godinez, Arch & Bldg 46: 421-2 N '14

Optical properties of diffusing media. Illum Eng Soc 10:353-402 no 5 '15

Continued Glare

Testing the gloss of paper and other materials, diag Illum Engr 8:425-7 O '15

Glasgow

Harbor

Improvement of the river Clyde and harbour of Glusgow, 1873-1914. T: Mason, Engineer 119:277 Mr 19 '15

Cleveland lantern for ornamental lighting. W. Harrison, if Elec W 66:521-4 S 4 15 Contributions of the chemist to the glass industry. A. A. Houghton. J Ind & Eng Chem 7:290-2 Ap '15 Daylight glass; abstract. S. H. Gage. Elec W 66:1041 N 6 '15 Development of daylight glass; with discussion. E: J. Brady. diags Illum Eng Soc 9: 937-60 no 9 '14 Glass-making at the Edit

Glass-making at the Ediswan works. il Illum Engr 8:434-5 O '15

Engr 8:434-5 O '15
Holophane glassware for shoplighting. Illum Engr 7:562 D '14
How glass is graded, M. McEvoy. Eng Rec 72:458 O 9 '15
Lighting of rooms through translucent glass ceilings; with discussion. E. J. Edwards, il Illum Eng Soc 9:1011-20 no 9 '14
Manufacture of laboratory glassware in Great Britain. D. G. Anderson. J Ind & Eng Chem 7:543-4 Je '15; Same. Sci Am S 80:59 Jl 24 '15
Manufacture of optical glass in America. Sci Am 11:175 F 20 '15
Partitions of translucent pressed-glass units. il Eng N 72:1269 D 24 '14
Relation of chemistry and mechanical manipulation to the evolution of the glass industry. R. L. Frink. Met & Chem Eng 13:800-2 N 1 '15

Sand blast for marking glassware. G: Spitzer and L. S. Trachsel, diag J Ind & Eng Chem 7:426-7 My '15

Sand diast for marking glassware, G: Shitzer and L. S. Trachsel, diag J Ind & Eng Chem 7:426-7 My '15
Selenium in the production of colored glass. S: Wein. Sci Am 112:361 Ap 17 '15
Triplex glass. Sci Am S 80:187 S 18 '15

Glass bricks

Translucent glass bricks. Sci Am S 79:3 Ja

Glass cutting

o cut glassware easily, E. J. Hall, Eng & Min J 100:315 Ag 21 '15

Glass factories

Illumination of glass factories. W: A. D. Evans. il Elec R & W Elec'n 67:78-81 Jl 10 '15

Glens Falls, New York

Bridges

Architectural effects secured in Glens Falls arch bridge over Hudson river. il diags Eng Rec 72:574-6 N 6 '15

Gloversville, New York

Sewerage

Construction and operation of Gloversville sewage works. H. P. Eddy and H. J. Hanmer. il plan Eng N 74:744-7, 780-1 O 14-21 '15

Absorption of glucose by bone-black. H. A. Morton. Am Chem Soc J 36:1832-8 S '14 Commercial glucose and its uses. G: W. Rolfe. Sci Am S 79:314-15 My 15 '15; Abstract. Met & Chem Eng 13:332-3 My '15 Comparison of the optical rotatory powers of the alpha and beta forms of certain acetylated derivatives of glucose. C. S. Hudson and J. K. Dale. Am Chem Soc J 37:1264-70 My '15 Contributions

ontributions of the chemist to the corn products industry. E. T. Bedford, J Ind & Eng Chem 7:275-6 Ap '15

Conversion table for glues, I, Ginsberg, J Ind & Eng Chem 6:1037 D '14 Hints on the use of glue. W. H. Wilkin. Bldg Age 37:63-4 N '15 Tests upon glue, particularly the tensile strength. A: H. Gill. diag J Ind & Eng Chem 7:102-6 F '15

Gluten

Colloidal swelling of wheat gluten, F. W. Upson and J. W. Calvin, il Am Chem Soc J 37: 1295-1304 My '15

Glyceric aldehyde

lyceric aldehyde Isolation of crystalline dl-glyceric aldehyde from a syrup obtained by the oxidation of glycerol. E. J. Witzemann. Am Chem Soc J 36:2223-34 O '14

Synthetic preparation of dl-glyceric aldehyde, E. J. Witzemann. Am Chem Soc J 36:1908-16 S '14

Glycocyamidine compounds

Researches on hydantoins; a new method of synthesizing glycocyamidine compounds, and the conversion of glycocyamidine into isomers of creatinine. T. B. Johnson and B. H. Nicolet. Am Chem Soc J 37:2416-26 O '15

Gogebic range. See Iron mines and mining-

Goggles

Colored glasses for eye protection. M. Luckiesh. Iron Tr R 57:437-8 S 2 '15
Goggles for gas welding and cutting. F. W. King. il Iron Age 95:295 F 4 '15
Goggles for grinders. H. W. Davie. Iron Age 94:1469 D 24 '14
How to test lenses of goggles. F. W. King. Foundry 43:449-50 N '15
Proper eye protection. W. B. McKibbin. il Mach 21:296 D '14
Specifications for chipper's goggles. diags Iron Tr R 55:1227 D 31 '14

Going value

Des Moines gas company case. Elec R & W
Elec'n 67:329-30 Ag 21 '15
Utilities bureau; conference on valuation, Phildelphia, 1915. Elec Ry J 46:1032-3 N 20 '15
Valuation of water works properties. H. P.
Gillette. Eng & Contr 44:258-61 O 6 '15

Gold and silver statistics, F: Hobart, Eng & Min J 99:47-8 Ja 9 '15 What excessive gold supply may do. Eng & Min J 100:465-6 S 18 '15

Nee also Gold dredging; Gold milling; Gold mines and mining; Quartz

Gold assaying

Amalgamation tests. W. J. Sharwood. Am Inst Min E Bul 104:1859-70 Ag '15; Excerpts. Met & Chem Eng 13:927 D 1 '15 Determination of piatinum, palladium and gold. A. M. Smoot. Eng & Min J 99:700-1 Ap 17

Determining percentage of gold in quartz.

Met & Chem Eng 12:744 D '14
Gold and silver assaying. S. Fischer, jr. Met & Chem Eng 12:771-3 D '14
Rapid method for washing gold beads. W: S.
Black. il Eng & Min J 98:1141-2 D 26 '14

Gold dredging

Application of electric motors to gold dredges.
G. B. Rosenblatt. il diag Am Inst E E Pro
33:1165-76 Ag '14; Abstract. Eng & Min J
98:739-40 O 24 '14; Discussion. Am Inst E E
Pro 34:144-54 Ja '15
Dredging and hydraulicking operations in the
Yukon. Eng & Min J 100:481 S 18 '15
Flume-type elevator dredges in Alaska. L: H.
Eddy. il Eng & Min J 99:1129-30 Je 26 '15
Gold dredging in 1914. R. E. Cranston. Eng &
Min J 99:100-1 Ja 9 '15
Gold dredging in the Philippines. il Eng &
Min J 99:685-8 Ap 17 '15
High yield of Iditarod dredge. il Eng & Min
J 99:727-8 Ap 24 '15
Nechi mines (Columbia) Itd. Eng & Min J 99:
244-5 Ja 30 '15
Pato property of Oroville dredging company.
W. A. Prichard. Eng & Min J 99:231-4 Ja
30 '15

W. A 30 '15

Requirements for prospecting dredging ground

in the Yukon. J. A. Macdonald. Eng & Min J 99:828-9 My 8'15 Steam-electric-driven dredge for the Philippines. il Eng & Min J 99:898-900 My 22 '15

See also Gold mines and mining

Gold metallurgy

Acid treatment of gold precipitate; abstract,
H. A. White. Met & Chem Eng 13:118-19 F

'15

Chlorination of ores. diag Met & Chem Eng 13:505 Ag '15

Concentrating Gold King ores. W. C. Prosser flow sheet Eng & Min J 100:633-4 O 16 '15 Prosser.

Gold metallurgy - Continued
Concentration formulas, J. E. Clennell. Eng & Min J 100:724-5 O 30 '15
Concentration formulas. L: Janin, jr. Eng & Min J 100:839 N 27 '15
Concentration of gold in bottoms in the copper converter; abstract. H. F. Collins. Met & Chem Eng 13:446 Jl '15
Electric furnace for gold refining at the Alaska-Treadwell cyanide plant. W. P. Lass. il diag Am Inst Min E Bul 103:1443-7 Jl '15; Same. Met & Chem Eng 13:566-7 S 1 '15; Excerpt (Electric precipitate-melting furnace) Eng & Min J 100:270-1 Ag 14 '15; Abstract. Eng M 50:456 D '15; Discussion. Am Inst Min E Bul 108:2456-8 D '15
Flotation in gold metallurgy. W. B. Blyth. Met & Chem Eng 13:308 My '15
Gold precipitation on paper. D. Lay. Eng & Min J 100:276-7 Ag 14 '15
Metallurgical practice in the Witwatersrand district, South Africa. F. L. Bosqui, diags Am Inst Min E Bul 101:997-1033 My '15; Abstract. Met & Chem Eng 13:925-7 D 1 '15; Discussion. Am Inst Min E Bul 108:2436-53 D '15

D'15
Metallurgy at the International engineering congress; symposium on gold and silver. Met & Chem Eng 13:721-5 0 15 '15
Mill and cyanide plant of Chiksan mines, Korea. C: W. De Witt. ii plan Am Inst Min E Bul 101:931-6 My '15; Abstract. Met & Chem Eng 13:388 Je '15
Progress in gold and silver metallurgy in 1914. Met & Chem Eng 13:3-5 Ja '15
Recent Rand metallurgical practice. M. T. Murray. Eng & Min J 99:771-3 My 1 '15
Refining base bullion. W; S. Mann. Eng & Min J 99:535 Mr 20 '15
Refining gold by Miller's chlorine process; abstract, R. Pearson. Met & Chem Eng 13:508
Ag '15

Ag '15 Relative efficiency of various amalgams in the recovery of gold. F. A. Thomson and R. Kef-fer. Met & Chem Eng 13:367-70 Je '15 Tonopah plant of the Belmont milling co. A. H. Jones. il diags flow sheet Am Inst Min E Bul 104:1731-58 Ag '15; Abstract. Met & Chem Eng 13:811-12 N 1 '15

See also Cyanide process

Gold milling

old milling
Amador consolidated milling plant, Amador
City, Calif. T. S. O'Brien, il flow sheet Eng
& Min J 100:255-7 Ag 14 '15
Crushing and grinding. L. D. Mills and M. H.
Kuryla. Met & Chem Eng 13:721-2 O 15 '15
Gold milling in California—a comparison. L. A.
Palmer, il diag Met & Chem Eng 13:617-24

S 15 15 15 Grinding ore for cyanidation; a suggested modification for all sliming practice. E. S. Pettis. Met & Chem Eng 13:910 Ja '15 New mill at Elko Prince mine, Midas, Nevada. Eng & Min J 100:474 S 18 '15

Jones. il diags flow sheet Am Inst Min E Bul 104:1731-58 Ag '15; Abstract. Met & Chem Eng 13:811-12 N 1 '15

& Chem Eng 13:811-12 N 1 '15

Gold mines and mining
Ancient gold mining in East Africa; extracts from Diodorus the Sicilian. A. B. Coli. Eng & Min J 99:1041-2 Je 12 '15

Cost of an ounce of gold. P. E. Barbour. Eng & Min J 100:49-50 Jl 10 '15

Gold recovery at placer mines. D. F. Carver. il Eng & Min J 100:472-3 S 18 '15

Opportunity in placer mining. C. Hartley. Eng & Min J 99:154-5 Ja 23 '15

Tonopah in 1914. F: Bradshaw. Eng & Min J 99:154-5 Ja 16 '15

See also Gold dredging: Hydraulic mining

See also Gold dredging; Hydraulic mining

# Alabama

Gold deposits in Alabama. Eng & Min J 99: 548 Mr 20 '15

Alaska and the Yukon

Bagley scraper for gravel mining in Alaska. L: H. Eddy. il Eng & Min J 100:257-8 Ag 14

Dawson, Nome and Fairbanks. H. I. Ellis, maps Eng & Min J 99:517-20 Mr 20 '15 Development methods at Fairbanks. H. I. Ellis, il diags Eng & Min J 99:1023-9 Je 12 '15

Elevating placer tailings with a Hayward bucket. H. I. Ellis. Eng & Min J 100:309-10 bucket. F

bucket, H. I. Ellis. Eng & Min J 100:309-10 Ag 21 '15
Koyukuk placer-mining district. Eng & Min J 99:1021-2 Je 12 '15
Prospecting methods at Fairbanks. H. I. Ellis. il diags Eng & Min J 99:805-10 My 8 '15
Quartz mining in Fairbanks district, Alaska. Eng & Min J 100:435 S 11 '15
Shushana mining district. H. I. Ellis. il map Eng & Min J 99:731-3 Ap 24 '15
Winter mining at Fairbanks. H. I. Ellis. il diags Eng & Min J 100:707-11 O 30 '15
Yakataga beach placers. A. G. Thompson. il Eng & Min J 99:763-5 My 1 '15

Gold mining in Bolivia. F. C. Lincoln. il Eng & Min J 99:351-4 F 20 '15

# California

California

Drift mines of California. J: D. Hubbard. il

Eng & Min J 100:667-8 O 23 '15

Pocket deposits of the Klamath mountains,
California. H: G. Ferguson. il maps Econ
Geol 10:241-61 Ap '15

Quartz veins in lamprophyre intrusions. J: F.
McLennan. Eng & Min J 99:11-13 Ja 2 '15

Seneca mining district, California. W. H.

Wright, il map Eng & Min J 99:1072-4 Je
19 '15

With the forty-niners. Eng & Min J 100:881 N 27'15

#### Canada

Kowkash gold district. Eng & Min J 100:595-6 O 9 '15

Gold and silver in Chile. M. R. Lamb. il Eng & Min J 99:847-9 My 15 '15

### Colombia

Placers of Antioquia, Colombia. R. W. Perry. il map Eng & Min J 100:585-9 O 9 '15

#### Colorado

Tenderfoot Hill, Cripple Creek. Eng & Min J 100:344 Ag 28 '15

## Dutch Guiana

Gold-bearing quartz veins in Dutch Guiana. J. B. Percival. il Eng & Min J 100:511-12 S 25 '15

# Nevada

Developments at Atlanta, Nev. P. W. Meyers. il Eng & Min J 99:541 Mr 20 '15 Pittsburg-Dolores mining co.'s mill at Rock-land, Nevada. E. J. Schrader. il Eng & Min J 99:653-4 Ap 10 '15

## New Mexico

Pinos Altos district, New Mexico. I. L. Wright. il Eng & Min J 99:133-5 Ja 16 '15

Hydraulicking at Waldo, Ore. W. H. Wright. il Eng & Min J 100:211-14 Ag 7 '15

## Quebec

Gold-bearing gravels of Beauce county, Quebec. J. B. Tyrrell. Am Inst Min E Bul 99: 609-20 Mr '15

## Russia

Eiderlinsky gold mines, N: T. Truschkoff, il Eng & Min J 99:1017-21 Je 12 '15

#### Siberia

Improvements at Lena goldfields. Eng & Min J 99:333-4 F 13 '15

### Transvaal

Mining conditions on the Witwatersrand. W. L. Honnold, diags Am Inst Min E Bul 104:1601-21 Ag '15

Mining in the Transvaal in 1914, H. F. Mar-riott. Eng & Min J 99:131-2 Ja 9 '15

Mining on the Witwatersrand. il Eng & Min J 100:320-2 Ag 21'15

Ore reserves of the Rand. A. C. Key. Eng & Min J 100:139-40 Jl 24 '15
Power supply of the Central mining-Rand mines group. J. H. Rider. il diags Inst E E J 53:609-32; Discussion. 53:633-40 My 1 '15

Gold mines and mining-Continued

Victoria

Placer mining in Victoria, Eng & Min J 99: 188 Ja 23 15

Washington

Gold Bar hydraulic mine, Blewett. H. I. Ellis. diags Eng & Min J 100:678-9 O 23 '15

Gold plating Gold and p 

Gold washing
Rapid method for washing gold beads. E. J.
Hall, il Eng & Min J 100:149-50 Jl 24 '15

olatile oils of the genus solidago. E. R. Miller and J. M. Moseley. Am Chem Soc J 27:1285-94 My '15

Goldfield, Nevada Goldfield and its present boom. H. C. Cutler. il Eng & Min J 99:221-4 Ja 30 '15

Goldfield Consolidated Mining costs at Goldfield, Eng & Min J 99:

Tennis as compared to golf. D. Douglass. Sci Am 113:383 O 30 '15

Golf balls Flight of a golf ball. Sci Am S 79:158 Mr 6 '15

Electric lighting of "court" and "clock" golf courses, M. E. Trimble, il diags Elec W 66:

Goltra process forcess the following process: beneficiation of Brown iron ores by means of a current of hot air and properly located screens. W: B. Phillips. Iron Age 94:1148-50 N 12 '14; Abstract. Eng M 48:582-5 Ja '15

Good roads congress, American. See American

Good roads convention, Canadian and inter-national. See Canadian and international good roads convention

Good roads show, Sixth
Sixth Good roads show, Chicago, Dec. 14-18.
il Good Roads n s 9:30-7 Ja 2 15

Good roads week Report on Good roads week at Cornell university. Good Roads n s 9:213-14 My 29 '15

Government employees

Accommodations de luxe for federal valuation
engineers, plan Eng Rec 70:696-8 D 26 '14
Canvastown for government employees in
New South Wales, il Sci Am 112:479 My 22

Comfort for workers in Washington's govern-ment buildings. D. A. Willey, il Sci Am S 78:373-4 D 12 '14

Government ownership

Discussion on government ownership. Elec Ry

Discussion on government ownership. Elec Ry J 111

Evils of government ownership. J. Bourne, jr. Elec Ry J 46:707-10 O 9 '15; Same cond. Ry R 57:490-2 O 16 '15

Government-owned dyestuff works in Great Britain. Textile World 48:371-3 Ja '15

Government ownership and municipal ownership condemned: discussion at 15th annual meeting of the National civic federation. Elec R & W Elec'n 65:1142 D 12 '14

Government ownership the miner. E. L. Bailey. Colliery 35:490-1 Ap '15

Government ownership discussed in Manila. Elec Ry J 46:22-3 J 3 '15

Governmental versus private enterprise discussions of the private enterprise discussed in Manila.

Governmental versus private enterprise discussed at National civic federation meeting. Elec W 64:1140-1 D 12 '14
Radium situation. W. F. Bleecker. Met & Chem Eng 13:143-5 Mr '15; Abstract. Eng M 49:102-3 Ap '15

Nee also Government regulation of industry; Municipal ownership; Public service corporations; Railroads and state

Government regulation of industry
Address to National association of cotton
manufacturers. A. G. Duncan. Textile
World 49:199-202 My '15
Administration and business men. L. Cromwell. Textile World 49:240-2 My '15
Business and government. E. Root. Ry R 57:
17-19 Jl 3 '15
Destructive and constructive regulation of
business. R. R. Lounsbury. Am Ind 16:10-13
Ag '15
German cartel policy O: H. Luken. For M. 48:

German cartel policy. O: H. Luken. Eng M 48:

508-16 Ja '15
Government's business. It needs regulation by business men. Ry 55:746-8 D 19 '14
Right of the states. Ry Age 59:43-4 Jl 9 '15
Right of the states which is often overlooked;

constitutional duty of federal government to protect from harmful regulation of com-merce by sister states. A. P. Thom. Ry Age 59:49-53 Jl 9 '15

See also Electric railroads and state; Facsee also Electric railroads and state; Factory laws; Gas companies—Regulation; Government ownership; Interstate commerce; Interstate commerce commission; Labor laws; Municipal ownership; Public service commissions; Public service commissions; Public service comporations—Regulation; Railroads—Rates; Railroads and state; Waterworks—Regulation

Governors, Conference of, See Conference of

Governors (machinery)
Analysis of waterwheel-governor effort; abstract. E. D. Searing. Elec W 65:1513-14 Je

12 '15
Blocking up the governor. R. O. Richards. il
I'ower 41:347-8 Mr 9 '15
Compensators for Corliss governors. C: L.
Ware. diags Power 42:93-4 J1 20 '15
Corliss governor compensator. J. Stewart.
Power 41:415-16 Mr 23 '15
Disturbing actions of a shaft governor: abstract. G. Hamabe. Am Soc M E J 37:124-5
E '15

Double-acting speed controller. il Mach 22:247

Overning of marine steam turbines. diags Engineer 119:235 Mr 5 '15 Governor-stop control and belt tightener. diags

Governor-stop control and belt tightener. diags Power 41:3 Ja 5 '15 Governors for motor vehicles. T. Douglas, diags Automobile 32:942-5 My 27 '15 Improved hydraulic governor. il Eng Rec 71: 383-4 Mr 20 '15 Metropolitan S. A. E. discusses aeroplanes and governors, diags Automobile 33:560-3 S 25 '15

One governor controls two waterwheels, il Eng Rec 71:372-3 Mr 20 '15

Pendulum governor compensator. B: S. Hanson, diag Power 42:488-9 O 5 '15

Prize-winning regulating device. il diag Power 40:900-1 D 22 '14

Pros and cons of speed governors. Horseless Age 35:705 My 26 '15

Grace, Eugene G. Future leaders of the steel industry. ( Stark, por Iron Tr R 55:1213-14 D 31 '14

Grade crossing elimination
Adjustment of the consequential damages at
the Tower Grove crossings. L. R. Bowen.
Assn Eng Soc J 55:116-21 O '15

Boston & Albany railroad improvements at Worcester, Mass. L. G. Morphy, il Boston Soc C E J 1:481-98 N '14

Chaos in apportioning the cost of grade crossing elimination. Eng Rec 71:319 Mr 13 '15 Chief engineers discuss grade-crossing law and cost distribution. Eng Rec 71:455-6 Ap 10 '15

Costs of bridges for grade-crossing elimination. C. N. Bainbridge. Eng Rec 71:770 Je 19 '15

Difficult grade crossing elimination in Albany, N. Y. il diags plan Ry Age 59:961-3 N 19'15

Eliminating railway grade crossings in Los Augeles. Eng N 74:355 Ag 19 '15 Eliminating the Tower Grove grade crossing at St. Louis. il diags plan Eng N 74:52-5 Jl 8 '15

Grade crossing elimination -- Continued

rade crossing elimination—Continucd
Elimination of grade crossinas; apportionment
of cost; manner of obtaining elimination;
construction, L. B. Reilly, Boston Soc C E J
2:135-48 Ap '15
Elimination of the Tower Grove crossings,
St. Louis, Mo. S. L. Wonson, il diags plans
Assn Eng Soc J 55:95-115 O '15; Same cond.
Ry Age 59:799-802 O 29 '15; Same cond. Eng
Rec 72:627-9 N 20 '15
Grade crossing eliminated without halting
traille, plan Eng Rec 71:72: de 5 '15
Grade crossing elimination. Ry Age 59:634-5 O
N '15

Grade-crossing law and its effect on grade-crossing elimination, C. W. Stark, Eng Rec 71:327-9 Mr 13 '15 Nucleus grane separation required of tail-

Ti32r-9 Mr 13 13 13 reads. Scales state separation required of rail-roads. C. E. Smith. Eng Rec 71:674 My 29 '15 Pennsylvania improvements through Piqua, Ohio: new station and second track on revised grade, eliminating eight street grade crossings. il plans Ry Age 58:103-6 My 14 '15 Study of grade crossing elimination in cities. C. N. Brandricke, diags Ry Age 58:15-8 J.

Substantial crossing barrier, il Ry Age 59:105

JI 16 '15

Track elevation on the Nickel Plate railroad at Chicago. il diag map Eng N 74:888-91 N 4 '15

See also Railroads-Track depression; Railronds-Track elevation

Grade crossings

Grade crossings in Canada. Ry Age 57:1180 D

Protection of grade crossings, il Ry R 57:531-2 O 23 '15; Same cond. Ry Age 59:763-4 O 22 Track crossing on curve with superelevation. plan Eng N 72:1133 103 114

Sec also Grade crossing elimination; Railroads-Crossings; Railroads-Track eleva-

Grading

rading Conditions determining maximum grades and methods and cost of road grading in West Virginia. A. D. Williams. Eng & Contr 43: 16-17 Ja 6 '15; Excerpt (Cost of grading and excavating). Concrete Cem 5:267-8 D '14 Grading machine loads nine two-yard wagons in ten minutes. il Munic Eng 49:124-5 S

Power road machinery with special reference to hauling and earth road grading. N. De Wind. il Eng & Contr 43:83-5 Ja 27 '15 Preliminary estimating of grading simplified. J. M. Brown. Eng Rec 71:610-11 My 15 '15 Street and road grading, 1915; tabulation. Munic Eng 48:257-60 Ap '15

Sec also Railroads-Grade; Roads-Grade

Grahamite

Variations of the physical characteristics of a petroleum residuum with increasing percentages of grahamite. H. Rossbacher. J Ind & Eng Chem 7:205-6 Mr '15

Grain

Accuracy of grain in weights. F. C. Maegly.
Ry Age 58:888-9 Ap 23 '15
Acid ratio: a new method for determining the proteolytic strength of germinated grain in technical analysis. C. A. Nowak. J Ind & Eng Chem 7:858-9 O '15
Apparatus for cleaning, separating and delivering grain. il diags Engineer '119:338 Ap 2 '15
Western rate advance bearing. By Age 58.

Western rate advance hearing. Ry Age 58: 938-9 Ap 30 '15

Grain dust

rain dust Cereal dust explosions, D: J. Price, Colliery 35:671-2 Jl '15 Explosibility of grain dusts, D: J. Price and H. H. Brown, Sci Am S 78:368 D 5 '14 Explosion leaves grain elevator practically in-tact, il Eng Rec 72:119-20 Jl 24 '15

Grain elevators

Design, construction and detailed costs of the sliding forms for a reinforced concrete grain storage house. W: W. Hay. Eng & Contr 44:304-5 O 20 '15

Electric drive for grain elevators, Elec R & W Elec'n 66:378 F 27 '15

Electricity in grain elevators. H. E. Stafford. il diags Am Inst E E Pro 34:1987-1103 Je 15: Abstract. Elec W 66:09 Jl 19-15 Pneumatic grain elevating plant il diag (supp) Engineer 120:361, 366 O 15-15 Righting a twenty-thousand-ton grain elevator. il Sci Am 111:524 D 26-14 Righting the tilted grain elevator of the Canadian Pacific Ry. il Concrete Cem 6:196 Ap '15

Settlement of two grain elevators. Eng N 73: ×72-3 My 6

Grand Trunk Pacific railway
Plan and profile of the western section, map
Eng N 74:245 Ag 5 '15

Grandstands

Cast-iron standards for ball-park seats, diag Eng N 74:511 S 9 '15 Grandstand at Sheepshead Bay speedway, New York, il diags Eng Rec 72:411-12 O 2

arge steel grandstand for automobile race-track, Sheepshead Bay, N. Y. il Eng N 74: 655 S 30 '15

National league ball park at Boston, Mass. il diags Eng N 74:374-7 Ag 19 '15
National league baseball park of reinforced concrete at Boston, W. B. Conant. il diags Concrete Cem 7:53-5 Ag '15

Granite

Boulder batholith of Montana. P. Billingsley. diags maps Am Inst Min E Bul 97:31-47 Ja

Heating tests, and the light they throw on the cause of the disaggregation of granite. W. A. Tarr. Econ Geol 10:348-67 Je '15

Granite blocks

Manufacture of granite paving blocks. il Eng N 73:376-81 F 25 '15

Granite pavements. See Pavements, Granite

Grape juice

New discovery in the American wine industry; concentrating grape juice by freezing.

Sci Am 113:141 Ag 14 '15

Graphic methods

Generalized form of Hooke's law. E. R. Hed1948. Else N 711512-3 S 16 15
Graphic method for speed-time and distancetime curves. E. C. Woodruff. Am Inst E E
Pro 33:1689-92 N '14; Discussion. Am Inst
E E Pro 34:2804-46 N '15; Abstract. Elec Ry
J 44:1155-6 N 21 '14
Graphic methods for presenting data. W. C.
Brinton. il Eng M 47:651-66, 817-29; 48:7385, 229-41, 396-406, 551-68 Ag '14-Ja '15
Graphics in maintenance work. Elec Ry J 46:
947-51 N 6 '15
Graphs as an aid to the plumber and fitter.
H. Whitehead. Dom Eng 70:136-8 Ja 30 '15
Graphs, charts and statistics as aids to administration. E. C. Stothart. Elec Ry J 46:
Joint committee on standard.

oint committee on standards for graphic presentation; preliminary report. Am Soc M E J 37:vii-ix Ag '15; Same. Am Inst Min E Bul 106:ix-xii O '15; Same. J Ind & Eng Chem 7:894-5 O '15; Same cond. Eng Rec 72:633 N 20 '15

Nomographic charts for Kutter's formula. G. S. Coleman. Eng Rec 72:489 O 16 '15

Practical applications of the principles of statistics. C: S. Ruffner. Assn Eng Soc J 53: 264-80 D '11

Simplified method of determining cost of coal per 1000 lb, of steam; chart, W. H. Schott. Elec W 66:754-6 O 2 '15; Same. Power 42:456-8 S 28 '15; Same. Eng & Min J 100:636-8 O 16

Solar declinations computed by graphic method. R. R. V. Reynolds. Eng Rec 72:160 Ag 7

Solution of pulp problems by graphic methods. W. J. McCauley. Eng & Min J 100:98-

Graphic statics Design methods in concrete construction. J. Cochran. Concrete Cem 6:83-5 F '15

Graphical analysis of arches with fixed ends greatly simplified, C. S. Whitney. Eng Rec 72:324-6 S 11 '15

Graphic statics -- Continued

Graphical method for designing simple reinforced concrete beams and data for designing simple, double-reinforced and T-beams. R. R. Leffler. Eng & Contr 43:239-42 Mr 17

Method for determining two-hinged arch reactions. C. S. Whitney. Eng & Contr 44: 123-4 Ag 18 '15

actions. C. S. withney. Eng & Contr 41. 123-4 Ag 18 '15 Nomographic charts for simple beam design. C: D. Conklin, jr. Eng Rec 71:809 Je 26 '15 Nomographic solutions for formulas of various types. R. C. Strachan. Eng Rec 71:807-9

Reinforced-concrete conduit analysis simplified by theory of displacements. C. S. Whitney. Eng Rec 72:486-8 O 16 '15

See also Girders; Mechanical draw Steel construction; Strains and stresses

raphite
Can profits be made in American graphite? J. Bartley. Iron Age 96:86-8 Jl 8 '15
Defense of natural graphite lubricant. Horseless Age 35:127 Ja 27 '15
Feeding graphite to boilers. C. N. Wiley. diags Power 41:616-17 My 4 '15
Graphite in boilers. W. Weaver. Power 41:131-2 Ja 26 '15
Phenix oil and graphite cylinder lubricator. diag Power 41:780-1 Je 8 '15
Silica-graphite paint. Iron Tr R 57:364 Ag 19 '15

Uses of graphite. Metal Work 84:463 O 8 '15 Various forms of graphite. Sci Am S 80:25 Jl 10 '15

Grates

Air-space area of grates. R. T. Strohm. Elec W 65:103 Ja 9 '15 German progress in steam boiler firing; ab-stract. Pradel, diags Am Soc M E J 37:185-7 Mr '15

Hopes pyramid dumping and stationary grates, il Power 42:156-7 Ag 3 '15
Making a herringbone grate pattern. E. L. Scillitoe. diags Foundry 43:184 My '15
Placzek traveling grate. diag Am Soc M E J 37:
118 F '15

Poillon furnace grate. diag Power 41:499 Ap 13 '15

See also Locomotive grates

## Grates (fireplaces). See Fireplaces

Gravel

ravel
Centrifugal dredging pump applied to production of sand and gravel, il Concrete Cem 7:191-2 N '15
Cost of hydraulic sand and gravel mining,
R. J. Borhek, Eng & Contr 43:573-4 Je 30

Dragline cableway is an effective tool for sand and gravel plants. il Eng Rec 71:716-18

Sand and glaver plants, it Eng Rec 17:17-19 J1 16 '15
Economical operation of a gravel ballast pit. Ry Age 59:117-19 J1 16 '15
Electricity in sand and gravel plants, il Elec R & W Elec'n 67:599-602 O 2 '15
Equipment and operation of plant at Waukesha, Wis. S. E. Bates. il diag Concrete Cem 7:165-8 N '15
Gravel and sand plants; stationary and portable screening and washing plants. il diags Munic J 33:449-50 Ap 1 '15
Gravel dredge which delivers graded materials.
A. Gottschalk. il Eng Rec 70:652 D 12 '14
Gravel washing plant with unique features, Pontiac, Mich. il Concrete Cem 7:168-70 N '15
Hoist on revolving headframe operates drag-

Hoist on revolving headframe operates drag-line, il diags plan Eng Rec 71:742-3 Je 12 '15 How the problem, What is gravel? might be solved, S. P. Sears, Eng N 73:180-1 Ja 28 '15 Large floating gravel-washing plant in Indiana. il Eng Rec 70:667-8 D 19 '14

Large gravel-washing plant, Akron, O. il Eng N 73:1225 Je 24 '15; Eng & Contr 43: 526 Je 9 '15

Notes on screens for gravel washing and screening. W. H. Wilms. diag Eng N 73: 440-1 Mr 4 '15; Same cond. Ind Eng 15:80-1 Ag '15

Portable gravel screening and washing plant. M. D. Campbell. plan Ry Age 59:345-6 Ag 20

Stripping of gravel pits by hydraulic methods. W. H. Wilms. diags Ry Age 58:1430-3 ods. V Je 18 v. '15

Je 18 '15
Use and tests of unscreened gravel: Illinois
state highway department. C. Older. il Eng
N 72:1204-5 D 17 '14
Wearing tests for sand and gravel. F. L.
Roman. Good Roads n s 9:186-7 My 1 '15

See also Concrete-Aggregate

Gravel roads. See Roads, Gravel

Gravitation
Modern theories of gravitation. Sci Am S
79:317 My 15 '15

See also Specific gravity

Graywacke

Composition of graywacke. Eng & Min J 100: 597 O 9 '15

Grease traps. See Plumbing-Traps

Greases. See Lubrication and lubricants; Oils and fats

Great Britain

See also Railroads-Great Britain

Admiralty inventions board

Board of inventions. Engineer 120:90 J1 23

Board of trade

Commercial organizations in the United Kingdom with a description of British man-facturers' and employers' organizations. A. J. Wolfe. U S Bur For & Dom Com 102: 29-36 '15

Commerce

British engineers' association; third m Manchester. Engineer 118:578-9 D 18

Commercial organizations in the United Kingdom with a description of British manufacturers' and employers' organizations. A. J. Wolfe. U S Bur For & Dom Com 102:1-53 '15

Export trade to the oversea dominions. Engineer 119:383-5 Ap 16 '15 Foreign mineral trade of Great Britain. Eng & Min J 99:442 Mr 6 '15

Institution of mechanical engineers: address. W. C. Unwin. Engineer 119:418 Ap 23 '15

Commercial policy

Plea for scientific and technical commissioners. W. P. Digby. Inst E E J 53:799-801 Je 1 '15; Excerpts. Met & Chem Eng 13:502

Industries and resources

Presidential address before Institution of civil engineers. A. Ross. Engineer 120:430-1 N

Law

Commercial laws of England, Scotland, Ger-many and France. A. J. Wolfe and E. M. Borchard. U S Bur For & Dom Com 97:9-23

Manufactures

British engineers' association; third meeting, Manchester. Engineer 118:578-9 D 18 '14

Navy

British battle-fleet: its inception and growth throughout the centuries by F. T. Jane. Review. Engineer 118:528-9 D 4 '14 Our navy. Engineer 119:185 F 19 '15

Submarine chasers for the British navy, il Sci Am 113:424 N 13 '15

Great Lakes

Buffalo sewage disposal and water-supply in relation to the pollution of the Great Lakes, Eng N 73:8-9 Ja 7'15

See also Welland ship canal

Great Northern railway
Additions and betterments of the Great Northern Ry. Ry R 56:11-13 Ja 2 '15

Greece Kavala, the debatable land. Sci Am S 80:312-13 N 13 '15

Greek architecture. See Architecture, Greek

Greek language
How we got our alphabet. W. Rice. Inland
Ptr 54:689-90 F '15

Greenhouses

Construction of a movable greenhouse. il Bldg Age 37:69-71 Ag '15
Design of greenhouse heating plants, P. Mc-Kee. Metal Work 83:805; 84:44-6, 337 Je 4, Jl 9, S 10 '15
Features of the modern greenhouse. J: Y. Dunlop. il Bldg Age 37:38-41 O '15
Heating equipment for large greenhouse. G: W. Loeber. il diags Metal Work 83:66-70 Ja 1 '15

Heating greenhouses by hot water. G: W. Loeber, diags Dom Eng 70:399-401; 71:31-3, 124-6, 244-5, 362-6 Mr 27, Ap 10, My 1, 29, Je 26 '15

Grenades

Hand grenades. E: C. Crossman, il Sci Am 112:427 My 8 '15

Grenfell, Wilfred Thomason, 1865-Dr. Grenfell's missions in Labrador, H. H. Heath, il Inland Ptr 55:53-4 Ap '15

Heath, il Inland Ptr 55:53-4 Ap '15

Grinding and polishing
Canvas polishing wheels. B. H. Divine. Metal
Ind n s 13:449 N '15

Eye protection for grinders and machinists.
H. W. Davie. il Mach 21:570-1 Mr '15

Form grinding. il diags Mach 21:883-92 Jl '15

Grinding and distribution of tools. Ry Age
(Mech ed) 89:415-16 Ag '15

Grinding and polishing stove plate trimmings.
F. W. Hobbs. Foundry 43:236-7 Je '15

Grinding cone pulleys at the Norton plant.
H. W. Ault. il diags Mach 22:32 S '15

Grinding crowned pulleys. H. W. Dunbar. il
Mach 21:893-4 Jl '15

Grinding of metals; abstract. J. Horner. Ind

Grinding of metals; abstract. J. Horner. Ind Eng 15:59 F '15

Grinding shrapnel shells on Norton grinding machines. il diags Mach 21:635-7 Ap '15 Grinding street car wheels under the car. il Mach 21:462 F '15

Grinding vs. milling. J: Mahon. diag Mach 21: 315 D '14

Institution of mechanical engineers, Manchester meeting, 1915. Engineer 120:417 O 29 '15 Internal grinding machines used, methods of handling and examples of work. D. T. Hamilton. il diags Mach 21:983-98 Ag '15 Laps and lapping; abstracts. W. A. Knight and A. A. Case. diags Am Soc M E J 37:451-6 Ag '15; Iron Tr R 57:24-6 Jl 1 '15; Mach 21:976-8 Ag '15; Discussion. Am Soc M E J 37:456-8 Ag '15 Metallographic grinding and polishing machine. il Iron Age 95:1164 My 27 '15 New method of polishing diamond dies. diag Mach 21:279 D '14 Plain cylindrical external grinding. D. T. Hamilton. il diags Mach 21:861-82 Jl '15 Polishing and buffing. B. H. Divine. Metal Ind n s 13:419-20 O '15 Polishing and plating room practices reviewed.

Polishing and butting. B. H. Divine. Metal Ind n s 13:419-20 O '15
Polishing and plating room practices reviewed. F. W. Hobbs. Metal Ind n s 13:414-15 O '15
Polishing machines made by the St. Louis machine tool co. il Metal Ind n s 13:386 S '15
Polishing wheels. W. C. Gold. il Metal Ind n s 13:15-16, 103-4, 279-80 Ja, Mr, JI '15
Preparation of metal specimens for metallographic tests. il Met & Chem Eng 13:400-1
Je '15
Progress in machine shop methods. E. R.

Progress in machine shop methods. E. R. Norris. il Iron Tr R 57:747-50 O 14 '15 Richards polishing machine. il Metal Ind n s 13:386 S '15

Surface and cylindrical grinding: operating conditions and rates of production for typical operations. R. Holmes. il diags Mach 21: 283-5 D '14

Z83-5 D 14 Surface grinding; methods of grinding plane surfaces on reciprocating and rotary surface grinding machines, D. T. Hamilton, il diags Mach 22:33-42 S '15 Theory of grinding, H. H. Asbridge, Engineer 120:440 N 5 '15

Theory of grinding, J. J. Guest. Engineer 120: 394-5 O 22 '15; Abstract. Am Soc M E J 37: 658-9 N '15

Tumbling barrel ("Jim Butler") work, T. C. Eichstaedt. Metal Ind n s 13:368-9 S '15

Two-belt rotary polishing machine, il Iron Age  $95{:}448~\mathrm{F}~25$  '15

See also Abrasives; Emery wheels; Grinding wheels; Machine shop practice

Grinding machines

rinding machines
Attachment for grinding curved knives. il diag
Iron Age 95:615 Mr 18 '15
Besly wide-face ring wheel grinder. il diag
Mach 22:242-3 N '15
Boring and grinding attachment. il Iron Tr R
56:1106 Je 3 '15
Brown & Sharpe plain grinding machine, il
diag Mach 21:675-6 Ap '15
Car wheel grinder. il Ry Age (Mech ed) 89:
143-4 Mr '15
Carwheel grinding machine, il Iron Age 94:

143-4 Mr 15
Carwheel grinding machine. il Iron Age 94:
1485 D 31 '14
Cincinnati rifle barrel grinding machine. diags
Mach 22:250-1 N '15
Combination precision internal grinder. il Iron
Tr R 56:1116 Je 3 '15
Diamond shear grinding machine. il Mach 21:
754-5 My '15
Disk and surface grinding machine by the
Walker grinder company, Worcester, Mass.
il Iron Age 94:1489 D 31 '14
Electric grinder for wood working shop. il Iron
Tr R 57:898 N 4 '15
Electric rail grinder, il Sci Am 113:49+ Jl 10

Electric rail grinder. il Sci Am 113:49+ Jl 10

15 Face grinding machine with magnetic chuck. il Iron Age 95:948 Ap 29 '15 Ford-Smith shrapnel shell grinder. il Mach 22:68-9 S '15 Gardner heavy disk grinding machine. il Iron Age 96:460 Ag 26 '15; Iron Tr R 57:444 S 2 '15; Mach 22:65-6 S '15 Grinding, a manufacturing process; a plea for the substitution of grinders for lathes on certain classes of work. H. W. Dunbar. Iron Tr R 56:917-18 My 6 '15 Grinding large shells and projectiles. C. O. Smith. il diags Iron Age 95:445-7 F 25 '15 Grinding practice. C: G. Smith. Mach 21:469 F '15

Hand-operated hole grinding machine, il Iron

Hand-operated hole grinding machine, il Iron Age 95:511 Mr 4 '15 Heavy grinding machine; use of a special gear box with a ball clutch to vary speeds and feeds, il Iron Age 94:1526-7 D 31 '14 Inexpensive wheel grinder, diags Elec Ry J 45:1175 Je 19 '15 Inserted-tooth saw grinding machine, il Iron Age 96:467 Ag 26 '15 Internal grinding machines used, methods of handling and examples of work, D. T. Hamilton, il diags Mach 21:983-98 Ag '15 J. N. Lapointe broach grinder, il Mach 21:513 F '15

N. I F '15

Large crank-shaft grinding machine. il diag Engineer 120:178 Ag 20'15 Machinery for the production of projectiles. il diag's Engineer 120:278 S 17'15

Modern grinding machines. il Mach 21:415-16

Modern grinding machines. il Mach 21:415-16 Ja '15
New plain grinding machine, il diag Iron Age 95:734-5 Ap 1 '15
Persons-Arter model A rotary surface grinder, il diags Mach 21:933-6 Jl '15
Persons-Arter rotary surface grinding machine, il Iron Age 96:11 Jl 1 '15
Plain and surface grinding machine, il Iron Age 96:1240 N 25 '15
Plain cylindrical external grinding. D. T. Hamilton, il diags Mach 21:861-82 Jl '15
Portable cylinder grinding machine, il Iron Age 95:400 F 18 '15
Portable pneumatic grinding machine, il Iron Age 96:83 Jl 8 '15; Iron Tr R 57:4 Jl 1 '15
Precision grinding machine, il Iron Tr R 56: 284-5, 287 F 4 '15
Rivett internal grinding machine, il Mach 21: 598-9 Mr '15
Self-contained grinding machine, il Ry Age (Mech ed) 89:91-2 F '15
Special grinding pattern shop machine, il Iron

Special grinding pattern shop machine, il Iron Age 96:193 Jl 22 '15

Special-purpose grinding machine: stan<mark>dard</mark> type of the Norton grinding company. if Iron Age 95:86-7 Ja 7 '15

Surface grinding; methods of grinding plane surfaces on reciprocating and rotary surface grinding machines. D. T. Hamilton. il diags Mach 22:33-42 S '15

Tolford ball grinding machine. C. L. Lucas. il diags Mach 21:311-14 D '14

Upright surface grinding machine. il Iron Age 96:7 Jl 1 '15

Grinding machines—Continued
Walker rotary disk and surface grinder, il
dlags Mach 21:417-19 Ja '15
Wide face ring wheel grinding machine, il Iron
Age 96:972 O 28 '15

See also Grinding wheels

Safety devices

Abrasive wheel safety code. Iron Tr R 56:171-

3 Ja 21 13 Code for the use of abrasive wheels. Iron Age 95:216-17 Ja 21 '15 Grinding safety devices. C: G. Smith. Iron Age 94:1392 D 17 '14

94:1392 D If '14
Grinding wheel protection. E. T. Spidy. diags
Ry Age (Mech ed) 89:249 My '15
How state laws compel removal of dust. H. C.
Estep. il Foundry 43:43-51 F '15; Same. Iron
Tr R 56:415-22 F 25 '15
Proposed grinders' safety code. Mach 21:460-2

Safety code for abrasive wheels. Ind Eng 15: 23-4 Ja '15

Grinding wheels

rinding wheels
Grinding wheel truing devices; attachments
for holding and methods of applying diamond
tools. D. T. Hamilton. il Mach 22:220-8 N '15
Grinding wheels; history and description of
various abrasive compounds. W. C. Gold.
Aletal Ind n s 13:450-2 N '15
How grinding wheels operate. G: I. Alden. Iron
Tr R 55:1141-2 D 17 '14
Constitute of grinding wheels in machine grind-

Tr R 55:1141-2 D 17 '14
Operation of grinding wheels in machine grinding. G: I. Alden. diags Mach 21:307-9 D '14;
Abstract. Am Soc M E J 37:16-17 Ja '15
Practical details about grinding. C: G. Smith.
Iron Tr R 57:443-4 S 2 '15
Selecting grinding wheels for foundry use.
C. F: Dietz. Foundry 43:115-20 Mr '15; Same.
Iron Tr R 57:314-18+ Ag 12 '15
Selection of grinding wheels; abrasives, processes of manufacture, bonds—choosing grade and grain for grinding under varying conditions. D. T. Hamilton. il diags Mach 22: 118-29 O '15
Selection of wheels for cylindrical grinding.

Selection of wheels for cylindrical grinding. C. H. Norton. Mach 21:368 Ja '15 Why your grinding wheel breaks. Foundry 43: 104 Mr '15

See also Emery wheels

Safety devices

Sec Grinding machines-Safety devices

Grizzlies

New types of grizzlies, il Eng & Min J 99:

241-2 Ja 30 '15 Rocker and grizzly mining on the north Sas-katchewan. J. A. Macdonald, diags Eng & Min J 100:187-8 Jl 31 '15

past erosion and protection on Long Island and New Jersey, G. O. Case, il diag Eng N 74:439-42 S 2 '15

Design suggested for shore-protection works on the New Jersey coast. B. F. Cresson, jr. diags Eng N 73:904-5 My 6 '15; Eng Rec 71:347-8 My 1 '15

Ground anchor

Coghlin ground anchor. il Ry R 56:132 Ja 23

Ground temperature. See Earth temperature Grounding. See Electric distribution

Group insurance. See Insurance, Life

Grouting

Astoria tunnel under the East river for gas distribution in New York city. J: V. Davies, il map Am Gas Light J 103:225-30, 244-7+ O 11-18 15

O 11-18 '15 Cutoff-wall and rock grouting at the Milton reservoir embankment, il diags map Eng N 73:468-71 Mr 11 '15 Deep tunnel completed in unsound rock solidi-fied by extraordinary grouting, il Eng Rec 72:417-19 O 2 '15

Flooding and recovery of the Astoria tunnel. H. Carpenter, il diags Eng N 74:673-8, 736-41 O 7-14 '15

Granite ranite block repaying in Worcester, C. D. Pollock, il Munic J 39:541-3 O 7 '15

Grouting a leaking tunnel. il Eng Rec 71:60 Ja

Grouting as a method of engineering construction. Eng & Contr 43:21-3 Ja 13 '15 Grouting equipment for city tunnel, Catskill aqueduct. W. E. Spear. diags Eng N 73:894

My 6 '15
Grouting foundations for gravity-section dam.
H. S. Johnston. diags Eng Rec 70:650-1 D 12

Grouting or cushioning stand pipe bases; abstracts. C: W. Sherman. Munic J 39:812 N 25 '15; Eng & Contr 44:410-11 N 24 '15 March-Capron mixer for concrete grouting. il Munic J 39:160 Jl 29 '15 Method and cost of grouting a water bearing fissure and seamy rock in sinking a mine shaft. J. R. Reigart, diags Eng & Contr 44: 353-5 N 3 '15

353-5 N 3 15 Methods and costs of grouting brick pave-ments, diags Eng & Contr 44:302-4 O 20 '15 Methods and costs of grouting granite block pavement. Eng & Contr 44:350-1 N 3 '15

Guarantees

itigation courted by express guarantees. E. J. Buckley. Metal Work 83:212 Ja 29 '15

Guard rails

B. R. & P. standard guard rail. diag Ry Age
58:1072 My 21 '15

Frog guard rails of special design. il diags Eng
N 72:1292-3 D 31 '14

New cast-steel clamp for guard-rails. diag Eng
N 72:1161 D 10 '14

N 72:1161 D 10 '14

Guard rails (for highways)

Comparative costs of guard rail and wide fills on highways. diags Eng N 74:79-80 J1 8 '15

Modification of the New York standard guard rail providing concrete posts. H. E. Smith. diags Eng & Contr 43:106 F 3 '15

Patented concrete guard rail, diag Eng N 74: 1056 N 25 '15

Guerrière (warship)
Fight between the Constitution and the Guerrière. il Sci Am 113:14-15 Jl 3 '15

Guilford, Baltimore, Md.

Architecture

Houses of Guilford, Baltimore, Md.; views and plans. Brickb 24:223-7, pl 124-35 S '15

Gulf of Mexico

Cause and prevention of storm erosion on Gulf coast. G. O. Case. il Eng N 74:1072-5 D 2 '15

Causes that govern its course, and its effect on climate. Sci Am S 78:383-4 D 12 '14

Gulflight (tank ship)
Repairing the Gulflight, il Sci Am 113:318 O
9 '15

Torpedo damage to the oil tanker Gulflight. il Int Marine Eng 20:520-1 N '15

Gums and resins Contributions

ums and resins
Contributions of the chemist to the naval
stores industry. J: E. Teeple. J Ind & Eng
Chem 7:931-2 N '15
Fossil resins in coal. Colliery 35:521-2 My '15
Naval stores industry. A. W. Schorger and
H. S. Betts. diags 11 pls maps U S Agric
Bul 229:1-58 '15

Pontianak (Jellutong) rubber resin. C. Ellis and A. A. Wells. J Ind & Eng Chem 7:747-50 S '15

Synthetic resins: non-inflammable substitutes for celluloid and rubber. il Sci Am 112:86 Ja for ce 23 '15

Use of ammonium hydroxide for the extrac-tion of rosin from wood. H. K. Benson and H. N. Crites. J Ind & Eng Chem 7:918-20 N

See also Balata

Gun. See Guns

Gun carriages

Rapid-fire field-gun carriages; development of devices for absorbing the shock of recoil. diags Eng M 50:118-19 O '15

Gun cotton Manufacture of gun cotton. L: J. Matos. Tex-tile World 49:503-6 Ag '15

Gun metal Influence filtuence of various temperatures on the properties of admiralty gun metal; abstract, A. Campion and J. G. Longbottom. Am Soc M E J 37:356-7 Je '15

## Gun powder. See Gunpowder

Gun-primers

Gun-primers and detonators, Sci Am S 80:35 Jl 17 '15

Gun recoil

Machining recoil cylinders for big guns. H. B. McDermid. diags Mach 21:1010-11 Ag '15 Method for calculating that part of the recoil momentum of a gun which is due to the action of the gases after the projectile leaves the muzzle. W: S. Franklin. J Fr Inst 179:559-77 My '15 Rapid-fire field-gun carriages; development of devices for absorbing the shock of recoil. diags Eng M 50:118-19 O '15 Recoil mechanism of modern guns. il Sci Am 113:296-7 O 2 '15

Concrete lining for steel bunkers. il Power 40: \$12 D 8 '14 Experience with cement guns in levee revet-ment. W. G. Caples. Eng & Contr 44:397-8 ment. V

Gunite casing on wood shaft lining. S. Royce. il diags Eng & Min J 99:409-11 F 27'15 Gunite concrete encasement. diags Ry R 56:

Interlining a timber and steel lined shaft with a cement gum. S. Royer, diag Eng & Contr 44:278 O 6 '15

Preventing corrosion of steel substructure of the Cortlandt street ferry terminal of the Pennsylvania in New York city. Ry Age 58:

Gunnery

Accuracy of gun fire. H. J. Jones. Engineer 120:239-40 S 10 '15

Gunnery aboard ships. A. Keller. Sci Am S 80:309 N 13 '15 Rifles and mortars. il diags Sci Am 111:472-3

Range finding; Target practice

Gunning-copper method

Comparison of the Gunning-copper method with the Kjeldahl-Gunning-Arnold method for the determination of nitrogen. O. F. Jensen. J Ind & Eng Chem 7:38-9 Ja '15

Old-fashioned gun powders. Sci Am 113:415+ N 6 '15 What happens when gunpowder explodes. Sci Am S 79:246 Ap 17 '15

See also Ammunition; Smokeless powder

Guns (ordnance)
Actual and theoretical ranges of the United
States coast defense guns. Sci Am 112:472
My 22 '15
British quick-firing field gun, diags Sci Am S
80:133 Ag 28 '15

British quick-firing field gun, diags Sci Am S S0:133 Ag 28 '15
Cost of munitions of war, Mach 21:405 Ja '15
European war from an engineer's standpoint,
J. B. C. Kershaw, il Eng M 49:43-50 Ap '15
French howitzers, il diags Engineer 118:562 D
11 '14

Gun and the aeroplane. B. Young, il Sci Am S 80:276 O 30 '15 Increasing the range of our coast defense guns. Sci Am 113:159 Ag 21 '15 Lesson of the Queen Elizabeth. Sci Am 112: 262 Mr 20 '15 Lewis light magazine gun. Sci Am 112:131 F 5 '15

Machine-gun and its development. N. Trus-low, il Sci Am 113:464+ N 27 '15 Making of large guns. diags Sci Am S 79:115 F 20 '15

Maxim machine gun and its construction. il Sci Am 112:130 F 6 '15

Range of a quick-firing field gun, il Sci Am 113:93 Jl 31 '15

Soixante quinze, The. diags Engineer 119:77-8 Ja 22 '15

Wire-winding big guns for Uncle Sam. C. L. Lucas. il Mach 21:529-31 Mr '15; Same. Sci Am S 79:332-3 My 22 '15

See also Ammunition; Artillery; Gun re-coil; Mortars (ordnance); Naval guns

Guns, Naval. See Naval guns

Gusset-plate diagram, W. M. Eliot. Eng N 73: 940 My 13 '15

Gutters

Advantages and disadvantages of the single gutter pavements. W. G. Kirchoffer. Eng & Contr 44:190-1 S 8 '15 Concrete and cast iron blocks for bridge gutter pavement, il Munic Eng 49:62 Ag '15 Concrete curb and gutter as constructed in Denver, Colo. E. B. Van de Greyn. il Munic Eng 48:16-18 Ja '15 Construction details and costs. Munic J 38: 153-9 F 4 '15

Curb and gutter in cities and counties, 1915; tabulation. Munic Eng 48:262-4 Ap '15

Street and sidewalk improvement in United States and Canada; tabulation. Munic Eng 48:352-8 Je '15

Street with a single gutter, W. G. Kirchoffer, Good Roads n s 9:138 Ap 3 '15; Same, Eng & Contr 43:229-30 Mr 10 '15

See also Pavements

Gutters (roof)

Making molded gutter in country shop, diags Metal Work 82:825-6 D 25 '14

Sheet metal gutter construction problems, diags Metal Work 83:700-1, 734 My 14-21 '15

Gymnasiums

Gymnasium for an industrial school at Fish-kill-on-Hudson, N. Y. il diags plan Bldg Age 37:19-25 S '15

Gypsum

Gypsum as a fireproof material. H. G. Perring. Munic Eng 48:73 Ja '15

Gypsum block in the Edison fire. S. G. Webb; V. G. Marani. Eng Rec 71:88 Ja 16 '15

Miocene age of Dodge gypsum, C: R. Keyes, Eng & Min J 100:466 S 18 '15

Occurrence of anhydrite in the United States. A. F. Rogers, il Sch Mines Q 36:139-42 Ja

Use of gypsum for fire protection. V. G. Marani. Eng M 48:596-8 Ja '15

Gyro-compass New gyroscopic compass. K. Scott. Met & Chem Eng 12:786 D '14

Gyroscope

Electric stabilizer for steamships. Elec R & W Elec'n 67:290-1 Ag 14 '15

Electrically driven gyroscope in marine work. H. C. Ford, il Am Inst E E Pro 33:873-87 Je '14; Same. Sci Am S 78:268-9, 284-5 O 24-31 '14; Same cond. Eng M 47:911-13 S '14; Discussion. Am Inst E E Pro 33:1890 D '14

Gyroscopic phenomena, B. L. Newkirk, diags Sci Am S 79:380-1 Je 12 '15

Gyrostats and their lessons. Sci Am S 79: 238-9 Ap 10 '15

See also Gyro-compass: Gyrotelescope: Unicycles

Gyrostatics

Gyrostatic action. J. G. Gray. il diags Sci Am S 79:172-3, 188-9 Mr 13-20 '15

Lord Kelvin's work on gyrostatics; with discussion. A. Gray, il Inst E E J 53:277-307 cussion. F 15 '15

Gyrotelescope Gyroscopic indicator for airships. C. Dienst-bach, il Sci Am 113:363+ O 23'15

# Н

Hahn, Otto H., 1845-1915 Sketch. por Eng & Min J 100:362 Ag 28 '15

Sudden turning grey of the hair. Sci Am S 80: 288 O 30 '15

Hair cloth
Dyeing hair cloth, il Textile World 49:348-9
Je '15

Halides

Method for the titration of small amounts of halides. F. C. McLean and D. D. Van Slyke. Am Chem Soc J 37:1128-34 My '15

#### Halifax, Nova Scotia

### Public works

New deep water pier at Halifax. A. F. Dyer, il Concrete Cem 7:7-13 Jl '15; Same cond. Eng N 73:1204-10 Je 24 '15

Hall effect

Application of the electron theory to various phenomena. J. P. Minton. Gen Elec R 18: 291-5 Ap '15

## Hallstead, Pennsylvania

## Bridges

Reinforced-concrete bridge with cantilever abutments, diags Eng Rec 70:622-3 D 5 '14

Halogens

Contributions to the knowledge of halogenation, R. L. Datta and S. D. Gupta, Am Chem Soc J 37:569-82 Mr '15

## Hamilton, Ontario

## Sewerage

West End sewage-treatment works, Hamilton, Ont. B. E. T. Ellis. diags plans Eng N 73:424-8 Mr 4 '15

Water supply

Reconstruction of the Hamilton, Ontario, water works. A. F. Macallum. Eng & Contr 44: 312-13 O 20 '15; Same. il Munic Eng 49:164-7 N '15

Hammers

ernagel. Mach 21:785 Je '15 Handy soft hammer. diags Eng & Min J 100: 883 N 27 '15

Power hammer equipment. C. A. Tupper. Iron Age 96:112 J1 8 '15

Hammers, Electric. See Electric hammers

Hammers, Pneumatic. See Pneumatic hammers Hampton institute

Industrial education in the South, il Bldg Age 36:60-4 D '14; 37:67-9 Ja '15 Work of the Hampton institute, il Inland Ptr 56:379-80 D '15

Hand railing, See Railings

## Harbors

Harbor development for Providence, R. I. plan Eng & Contr 43:sup21 Je 30 '15

Harbor developments at Toronto, Ont. Eng & Contr 43:sup21 My 26 '15

How \$30,000,000 is to be spent; allotment of appropriation to government river and har-bor projects. Eng & Contr 43:sup24 Ap 14 '15

Improvement of San Francisco's water front. J. Newman. il diags Eng N 73:326-8 F 18 '15

Works for the improvement of navigable estuaries; abstract. L. Luiggi. Eng Rec 72:637-8 N 20 '15

See also Breakwaters; Buoys; Docks; Dredges; Dredging machinery; Freight handling; Piers; Ports; Terminals; Wharves

Hardening

Hardening iron and its alloys: abstracts. C. A. Edwards and H. C. H. Carpenter. il Iron Tr R 55:1222-6+; 56:130-4 D 31 '14, Ja 14 '15

Hardening of metals. Am Soc M E J 37:489-90 Ag '15

Hardening of metals: discussion at the Fara-day society. il Engineer 118:503-5 N 27 '14; Met & Chem Eng 13:173-6 Mr '15

Two die and shell hardening furnaces, il Iron Age 96:79 Jl 8 '15

See also Case hardening; Steel, Hardening

Hardening of steel. See Steel, Hardening of

Hardie, James Keir, 1856-1915 Sketch, por Inland Ptr 56:197-9 N '15

Hardinge mill Britannia linings for Hardinge mills. G: Collins. Met & Chem Eng 13:650-1 O 1 '15

Britannia tube-mill lining. il Eng & Min J 99:239-40 Ja 30 '15

Hardinge conical ball mill. il diag Metal Ind n s 13:473 N '15

Hardinge mill data. A. F. Taggart. Am Inst Min E Bul 103:1365-76 Jl '15

Hardness
Brinell hardness and tenacity factors of a series of heat-treated special steels; discussion. A. McWilliam and E. J. Barnes. Met & Chem Eng 13:502-3 Ag '15
Brinnell hardness testing of non-ferrous alloys. V. Skillman. Metal Ind n s 12:423-4
O '14: Same. Foundry 43:111-12 Mr '15
Comparison of hardness testing apparatus. Mach 21:364 Ja '15
Hand device for testing hardness. M. F. Turpin. Iron Age 96:923 O 21 '15
Measuring the hardness of rubber. il Iron Age 95:1393 Je 24 '15
Testing the hardness of iron castings. G. S. Evans. il diag Iron Age 96:8-10 Jl 1 '15
Tool for hardness tests developed by L. Loewe & co. H. Friedmann. il Iron Tr R 57:899 N 4 '15
Hardware

Hardware British India; hardware lines. il U S Sp Cons Rep 72:215-31 '15 Electricity in hardware manufacturing. il Elec R & W Elec'n 66:801-6 My 1 '15

See also Bolts and nuts; Cutlery

Hardware association, National. See National hardware association

Hardware shops

Clearing the way for the season's business. il Metal Work 83:427-9+ Mr 19 '15 Combination shop can best serve community. il Metal Work 83:85-8+ Ja 8 '15

Northern hardwood forest; its composition, growth, and management. E. H. Frothingham. il map U S Agric Bul 285:1-79 '15

## Hartford, Connecticut

# Water supply

Addition to Hartford waterworks system augments daily supply by 30,000,000 gallons. i map Eng Rec 72:289-90 S 4 '15

Design and construction of the new supply conduit (Nepaug) of the Hartford water works. C. M. Saville. Eng & Contr 43:23-6 Ja

Hartford electric light company
Electrical equipment and efficient features of
new office building. il diag Elec W 65:206-9
Ja 23 '15 Hartlepool

Engineers and the Hartlepool raid. Engineer 118:610 D 25 '14

Harvard club of New York
Addition to the New York Harvard club. J: T.
Boyd, jr. il diags Arch Rec 38:615-30 D '15

Harvard university
Dudley memorial gate; views. Brickb 24:255-6 0 '15

Harry Elkins Widener memorial library: views and plans. Brickb 24:pl 106-11 Ag '15

Widener memorial library, il Arch & Bldg 47: 295-301 Ag '15

Harvest disease

Harvest disease due. Sci Am S 80:100 Ag 14 '15

Harvesting machinery Harvesting grain by motor power. il Sci Am 112:612 Je 19 '15

Seventy years of inventions, il Sci Am 112:512, 514 Je 5 '15

## Manufacture

Electricity in harvesting machinery works. il Elec R & W Elec'n 67:745-50, 883-8 O 23, N 13 '15

#### Hats

See also Panama hats

Haulage

Barney incline for hauling wagons out of pit. il Eng N 74:894 N 4 '15

Cart for rock quarries. G: B. Wilson. il Eng & Min J 99:365 F 20 '15 Centrally controlled electric haulage systems. F. E. Woodford. il Eng Soc W Pa 31:584-97; Discussion. 31:598-608 O '15

Gasoline locomotive hauls material trains for concrete highway. il Eng Rec 71:152 Ja 30

Haulage -- Continued

Hauling heavy water pipes, E. C. Miles, il Munic J 38:97-9 Ja 28 15
Machinery for construction and maintenance, haulage of stone, etc. T. R. Agg. Good Roads n 8 9:23-4 Ja 2 154, Same, Eng & Contr. 154, Same, Eng & Contr. 154

hadiage of stone, etc. T. K. Agg. Good Roads n's 9:23-4 Ja 2 Tor Same. Eng & Contr to: 156-8 F 17 '15 Method of computing average haul of road material used by the New York highway commission. Eng & Contr 43:17-18 Ja 6 '15 Motor cars supposit horaes in Vicinia for drayage. L. Spingler, il Elec Ry J 45:637 Mr

27 '15 Standard-gage railroad to haul road materials, il Eng Rec 72:393 S 25 '15 Turntable aids road contractor in solving hauling problem, il Eng Rec 72:303 S 4 '15 Wet concrete hauled from central plant on river, il Eng Rec 71:469-70 Ap 10 '15

See also Loading and unloading; Mine haulage; Motor trucks; Motor trucks in construction work; Railroads, Industrial; Tractors

Cost

Analysis of cost of hauling on country roads.
Eng N 73:174 Ja 28 '15

Comparative cost of handling earth on flat
and air dump cars. Ry Age 58:1444 Je 18 '15

Cost of handling material with motor versus
horse-drawn equipment. H: F. W. Arnold.
Eng M 50:28-32 O '15

Cost of motor-truck hauling depends on conditions. W: Collins, jr. Eng N 74:653 S 30 '15

Handling 400 tons of stone per day with auto
trucks. Eng Rec 70:621-2 D 5 '14

Hauling gravel with motor truck and trailers;
a service test in concrete road construction.
il Eng & Contr 42:535-6 D 9 '14

More use of motor trucks for hauling structural steel. D. P. N. Little. il diag Eng N 74:
554-5 S 16 '15

Motor, trucks for heavy structural steel. W:

554-5 S 16 '15

Motor trucks for heavy structural steel. W: Collins, jr. ii Eng N 74:174-6 Jl 22 '15

Portable railway in highway construction, il Good Roads n s 9:180-1 My 1 '15

Road building with industrial equipment: twelve-car train hauled by a 20-horsepower dinkey. il Eng Rec 70:621 D 5 '14

Trench spoil moved cheaply by tractor-trailer trains. il Eng N 74:842-3 O 28 '15

Underestimating the cost of motor trucking. E. N. Bryan. Eng & Contr 43:210 Mr 10 '15

Utilization of the motor truck in highway work, il Good Roads n s 9:171-9 My 1 '15 See also Mine haulage-Cost

Havana electric railway, light & power co., Havana, Cuba Hivana complified power piant. C. W. Ricker, il diags Power 42:218-22, 257-61 Ag 17-24 '15

11-24 '15
Havana—new power station, C. W. Ricker, il diags Elec Ry J 45:920-5 My 15 '15; Same; with table of electrical equipment, Elec W 65:1233-40 My 15 '15; Abstract, T. C. Ulbright, Sibley J 30:3-10 O '15

# Hawaiian islands

Sanitary affairs

Potable water supplies of the Hawaiian islands, S. W. Tay, Munic J 38:104 Ja 28 115

Life-study of patients. G: M. Gould. Sci Am S 79:226-7 Ap 10 '15

Headframes Steel headframe at no. 9 shaft, Republic mine, Vulcan, Mich, F. L. Burr, il plans Eng & Min J 100:379-82, 430-5 S 4-11 '15

Headgates, See Floodgates; Gates; Sluice gates Headgear

Su also Helmets

Heading machines National bolt header. il Mach 21:833-4 Je '15: Iron Age 95:1217 Je 3 '15: Iron Tr R 57:265 Ag 5 '15; Ry Age (Mech ed) 89:373-4 Jl '15 Headlights

Incandescent headlights and projectors. P Bailey. il Illum Eng Soc 10:271-80 no 3 " Incandescent lamps for projectors. L. Porter. il Gen Elec R 18:371-6 My '15

Pressed-steel headlight for interurban cars. il Elec Ry J 46:1048-9 N 20 '15

Headlights, Automobile. See Automobiles-

Headlights, Locomotive. See Locomotive headlights

Health boards

Co-operative health board. Sci Am 112:336 Ap 10 '15

Health insurance. See Insurance, Health

Health resorts

Cost of health-seeking. Sci Am 112:78 Ja 23 '15

Heart

Instrumental study of the heart, il Sci Am 112:630-1+ Je 26 '15

Heat developed in crushing. J. Cook. Eng & Min J 99:976-8 Je 5 '15; Abstract. Met & Chem Eng 13:190 Mr '15
Uses of intense heat and some of its applications to industrial processes. Sci Am S 80:243-4 O 16 '15

Socials of the State of the Sta

Heat conductivity

eat conductivity
Dissociation of hydrogen into atoms. I. Langmuir and G. M. J. Mackay. Am Chem Soc J. 36:1708-22 Ag '14
Temperature changes in wood under treatment.
G: M. Hunt. Eng Rec 71:144-5 Ja 30 '15
Thermal conductivity of refractories. B. Dudley, jr. Met & Chem Eng 13:315-16 My '15

Heat engines

leat engines

Efficiency of heat engines. (Engineers' study course) Power 41:136-7 Ja 26 '15

Efficiency of heat engines. R. L. Wales. Power 42:17-18 Jl 6 '15

Heat-engine cycles. Power 41:173-5 F 2 '15

Theoretical efficiency of heat engines. F. G. Gasche. Power 41:753-4 Je 1 '15

Theoretical efficiency of heat engines. R. C. H. Heck. Power 41:534-6; 42:131 Ap 20, Jl 27 '15

See also Polices. Moreover, Cas, and edition.

, See also Boilers, Mercury; Gas and oil engines; Steam engines

Heat radiation

Apparatus for the study of heat radiation. J. D. Hoffman. il Heat & Ven 12:28-30 O '15 See also Heating-Tables, calculations, etc.

Heat regulators Foxboro temperature regulator, il Power 40: 823-4 D 8 '14

Window displays boost regulator sales. Metal Work 83:46-8 Ja 1 '15

Heat transmission

Work 83:46-8 Ja 1 '15
leat transmission
Analyzing heat flow; use of aluminum for automobile motor construction. E. H. Sherbondy, Automobile 33:834-5 N 4 '15
Basis for rational design of heat transfer apparatus. E. E. Wilson. Am Soc M E J 37: 546-9; Discussion. 37:549-51 S '15
Coefficient of heat transmission in a pressed steel radiator; with discussion. J: R. Allen. plans Am Soc Heat & V E 20:86-93 '14
Difficulty of measuring heat, with special reference to radiated and convected heat. A. H. Barker and F. C. S. Brendal. Heat & Ven 12:21-4 My; 33-4 Je'15
Effect of radiator decoration. T: Tait. Dom Eng 72:341-2 S 18 '15
Establishment of a standard for transmission losses from buildings of all constructions. R. P. Bolton. Heat & Ven 12:19-23 Jl '15; Same. Dom Eng 73:264-6 N 27 '15; Same cond. Metal Work 84:373+ S 17 '15
Heat emitting capacity of radiation. C: D. Allan. Heat & Ven 12:32-4 Ag '15
Heat from radiators under different temperatures. C: A. Fuller. Heat & Ven 12:32-5 Mr '15
Heat losses by transmission through various

Heat losses by transmission through various building materials. L. A. Harding. Am Soc Heat & V E 19:208-18 '13 Heat losses in steam transmission; abstract. W. L. Cathcart. Am Soc M E J 37:611 O '15

Heat transmission and tube length in marine feed-water heaters; abstract. L. Loeb. Am Soc M E J 37:483-7 Ag '15

Heat transmission—Continued
Heat transmission capacity of a silica dish.
W. K. Lewis. il diag J Ind & Eng Chem
7:410-14 My '15
Heat transmission with pipe coils and cast-iron
heaters under fan blast conditions; with
discussion. L. C. Soule. il plan Am Soc Heat
& V E 19:391-411 '13
Heating data for varying conditions. J. A.
Donnelly. Heat & Ven 12:28-33 Jl '15
Measurement of the efficiency of domestic
fires, and on a simple and smokeless grate.
A. V. Harcourt. il Am Soc M E J 37:419-20
Jl '15
Measurement of the temperature drop in blast-

J1 '15
Measurement of the temperature drop in blastfurnace hot-blast mains, R. J. Wysor, diag
Am Inst Min E Bul 106:2161-70 O '15; Abstract. Iron Age 96:869 O 14 '15
Notes on some recent researches. J. E. Petavel, diag Engineer 120:433-4 N 5 '15
Standard methods of proportioning direct radiation and standard sizes of mains. J. A.
Donnelly. Dom Eng 72:366-8; 73:2-4 S 25-O

Surface condenser; with discussion, C. F. Braun, diags Am Soc M E J 37:459-65 Ag

Tests on the heat transmission of direct radiaests on the heat transmission of direct radia-tors at low differences in temperature. J. A. Donnelly. diag Heat & Ven 11:36-7 S '14; Same. Am Soc Heat & V E 20:405-7 '14; Same. Dom Eng 68:65 Jl 18 '14; Discussion. Heat & Ven 11:38-9 S '14; Discussion. Am Soc Heat & V E 20:408-11 '14

See also Heat conductivity; Heat radiation; Insulation (heat)

Heat treatment

Heat treatment of copper and brass, C. R. Hayward, il Metal Ind n s 13:275-7 Jl '15

Heat treatment of steel. See Steel, Heat treatment of

Heaters

Combustion of coal in domestic heaters. R. W. Davenport. Metal Work 83:928-9 Je 25 '15 Condensation in hot-blast heaters. J. D. White. Power 41:128 Ja 26 '15 Heat transmission with pipe coils and castiron heaters under fan blast conditions; with discussion. L. C. Soule. il diag Am Soc Heat & V E 19:391-411 '13 Heaters for fan work. C: L. Hubbard. Eng M 48:569-72 Ja '15

48:569-72 Ja '15 Problems in power-plant design. (Engineers' study course) C: L. Hubbard, Power 40:820-2 D 8 '14

Nee also Electric heaters; Gas heaters; Solar heaters; Water heaters

Heaters, Electric, See Electric heaters

Advance in heating and ventilating field, R. C. Carpenter, Metal Work 84:431-3 O 1 '15 American society of heating and ventilating

American society of fleating and ventuating engineers; twenty-first annual meeting, Jan. 20-22, 1915. Heat & Ven 12:39-48 F '15 Analysis of a combination heating system; with discussion. F. K. Chew, plans Am Soc Heat & V E 19:89-103 '13

Heat & V E 19:89-103 '13

Kaiser. Heat & Ven 12:45-6 S '15

Blower systems for heating and ventilating.

A. M. Feldman, diags Dom Eng 69:257 N 28
'14; Same. Am Soc Heat & V E 20:412-15 '14

Can we locate the neutral zone in heated buildings? abstract. J. J. Blackmore. Am Soc M E J 37:560 S '15

Design of greenhouse heating plants. P. Mc-Kee. Metal Work 83:805; 84:44-6, 337 Je 4, Jl 9, S 10 '15

Design of warm air heating systems. W. F.

J1 9, S 10 '15
Design of warm air heating systems. W. F.
Colbert. Metal Work 83:219-20 F 5 '15
Designing of warm air heating systems. R. E.
Lynd. plans Metal Work 83:192-7 Ja 29 '15
Developments and present problems in heating and ventilation. J: R. Allen. Am Soc Heat
& V E 19:53-62 '13

& V E 19:53-62 '13
Edison phonograph shop. C. E. Daniel. plans
Heat & Ven 12:13-18 Ap '15
Electric fans in the winter: installed in the
cold-air intakes of furnaces to increase temperature and reduce coal consumption.
P. W. Gumaer. plans Elec W 65:229-31 Ja 23
'15; Abstract. Heat & Ven 12:46-7 S '15;
Abstract. Ind Eng 15:79 Ag '15

Engineers show need of good ventilation. Metal Work 83:203-7+ Ja 29 '15
Future developments in heating and ventilation. A. H. Barker. Power 41:897-8 Je 29 '15; Abstract. Am Soc M E J 37:490-1 Ag '15
Heating a suburban house by furnace. il diags plans Bldg Age 37:19-26 Mr '15
Heating and ventilating conditions in large office building. C. E. A. Winslow and G. F. Maglott. Heat & Ven 12:26-31 F '15
Heating and ventilating in Germany. H. W. E. Muellenbach. Am Soc Heat & V E 20:186-96 '14

14
Heating and ventilating industrial plants.
E. L. Hogan. Metal Work 83:263-5 F 12 '15;
Same. Dom Eng 70:239-41 F 20 '15
Heating and ventilating practice in Sweden.
H. Theorell. Am Soc Heat & V E 20:94-7 '14
Heating and ventilating stables and garages.
C: L. Hubbard. diags Dom Eng 72:168-70

C: L. H Ag 7 '15

C: L. Hubbard, diags Dom Eng 72:168-70 Ag 7 '15

Heating and ventilation of main floor and vestibules of the Lord & Taylor store. J. Graham, diags Dom Eng 72:282-3 S 4 '15

Heating and ventilation of offices and banking rooms. C: L. Hubbard, diags Brickb 23: 307-10 D '14

Heating equipment of federal building, Denver. il Metal Work 84:247-9+ Ag 20 '15

Heating installations in private dwellings. R. E. Lynd. Metal Work 83:135-7 Ja 15 '15

Heating outfit adapted to an old house, il plans Metal Work 83:93-4 Ja 8 '15

Heating progress, S: R. Lewis, il Dom Eng 69: 398-400 D 26 '14

Heating systems in the United Kingdom; open-grate fire vies with coal and wood stove. Metal Work 83:97-8 My 14 '15

Heating the skyscraper and its problems; abstract. W: H. Driscoll, Heat & Ven 12:44-5

Ja

Ja 15
Heating trade wants six-inch studs. Bldg Age 37:61 Jl '15
House heating in European countries. Metal Work 84:273 Ag 27 '15
Importance of a proper perspective. S. R. Lewis. Am Soc Heat & V E 20:249-52 '14 Inside circulation system in northern Maine.

Metal Work 83:529-30 Ap 9 '15

Inside circulation system in northern Maine. Metal Work 83:529-30 Ap 9 '15

Lecture course on elements of heating. C: A. Fuller. diags Metal Work 81:34-5, 209, 281-2, 338-9, 395-6, 460-1, 651-2, 686-7; 82:100; 83: 927; 84:212-13, 303-4, 480+, 583+ Ja 2, 30, F 13, 27, Mr 13, 27, My 15-22, Jl 24 '14, Je 25, Ag 13, S 3, O 1, N 5 '15

Measurements for the household. U S Bur Stand Circ 55:55-67 '15

Merits of vapor systems for house heating. N. W. Taplin. Metal Work 83:475-6 Mr 26 '15

Modern practice in heating and ventilation. A. G. King. Dom Eng 63:2-4, 61-4, 182-3, 339-41; 64:37-9, 99-101, 122-4, 273-5; 65:2-4, 341-3, 365-6; 66:5-8, 231-4, 328-31; 67:190-2, 288-9+; 68:124-6: 69:354-5; 70:2-4, 268-9, 366-8; 71:2-3, 92-3, 182-4, 276-8; 72:2-4, 102-4, 310-12 Ap 5, 19, My 17, Je 21, Jl 12, 26, Ag 2, S 6, O 4, D 13-20 '13, Ja 3, F 21, Mr 14, My 16, Je 6, Ag 1, D 19 '14, Ja 2, F 27, Mr 20, Ap 3, 24, My 15, Je 5, Jl 3, 24, S 11 '15

Modern practice of recirculating air effects economy and makes satisfied customers. G. D. Crain, jr. Metal Work 82:769 D 11 '14

Problems in power-plant design. (Engineers' study course) C: L. Hubbard. Power 40:820-2, 858-60, 894-7 D 8-22 '14

Progress of heating and ventilating art in the last decade. R. C. Carpenter. Sibley J 30: 51-4 N '15

last decade. R. 51-4 N '15

Regulating warm air furnace practice; tentative recommendations for a standard of procedure. Metal Work 83:646-8 Ap 30 '15

Saving fuel in heating a house. L. P. Brecken-ridge and S. B. Flagg. U S Bur Mines Tech Pa 97:1-33 '15; Same cond. (Firing various fuels in residence heaters). Metal Work 84: 552-4, 584-6, 613-15 O 29-N 12 '15

Selecting equipment for heating system. Metal Work 82:828-9 D 25 '14

Successful warm air heating systems. J: H. Hussie. Metal Work 84:3+ Jl 2 '15

Systems for the engineer and contractor. T: Barwick. Heat & Ven 11:27-34 N; 15-21 D '14; 12:18-22 Ja '15

Heating—Continued

Test of a hot blast air tube heating system.
E. H. Lockwood and A. C. Staley. diag Heat
& Ven 11:29-34 D '14

Tests of heating coils under fan blast conditions as conducted at Institute of thermal research, Buffalo, N. Y., July 18, 1913: report
of committee. Am Soc Heat & V E 20:216-19
'14

Metal Work 83:661+, 772-3, 842-3: 84:47-9, 109-10, 184-5, 203-4, 242-3, 310-11, 329+, 451-3, 558-9 My 7, 28, Je 11, JI 9, 23, Ag 6-20, S 3-10, O 8, 29 15 Theory

10, O 8, 29 '15
Theory and practice of heating and ventilating in France, G. Debesson, diags Am Soc Heat & V E 20:124-50 '14
Two-family house heated by furnace, diags plans Bldg Age 37:67-70 D '15
Warm air furnace in trying location, il plans Metal Work 83:327-30 F 26 '15
Warm air heating for suburban residence, il plans Metal Work 83:327-30 F 20 '15
Warming and circulating air in residence, diags plan Metal Work 83:255-6 F 12 '15
Wind leakage, F. K. Davis, Heat & Ven 12: 48-9 Ap '15
See also Boilers, Heating: Car heating:

48-9 Ap '15

See also Boilers, Heating; Car heating; Chimneys; Churches—Heating and ventilation; Electric heating; Fireplaces; Fuel; Furnaces, Hot air; Gas heating; Heaters; Heating apparatus; Heating contracts; Heating from central stations; Hot water heating; Hotels—Heating and ventilation; Radiators; Schoolhouses—Heating and ventilation; Solar heaters; Steam heating; Stoves; Ventilation; also Institute of heating and ventilating engineers

#### Cost

Cost of heating and ventilating systems. Heat & Ven 12:61-2 Mr '15
Expense of operating heating and ventilating plants; with discussion. H. M. Hart. Am Soc Heat & V F 19:309-27 '13
House heating with natural gas for fuel. F. R. Hutchinson. il Metal Work 84:9-12+

House heading the F. R. Hutchinson, il Metal Work 84.9-12 T Jl 2 '15

New York city heating costs. Power 42:236 Ag 17 '15

Records for two factory buildings and a Y. M. C. A. building, S. R. Lewis. Heat & Ven 12:20-2 Ag '15

Estimate record blanks in book form. Metal Work 83:201 Ja 29 '15 Handy estimate sheet for heating work. Metal Work 83:151+ Ja 22 '15

## Laws and regulations

Laws and regulations

Bill to regulate installation of heating systems before legislature in Massachusetts.

Dom Eng 70:269-70 F 27 '15

Code regulations and furnace installation.

F. K. Chew. Metal Work 83:908 Je 18 '15

Features of nineteen typical heating franchises. il Heat & Ven 12:43-5 Jl '15

Heating ordinance of Cleveland, Ohio. V. D.

Allen. Dom Eng 70:44-6, 72-4, 155-6 Ja 9-16, 30 '15

30 '15 Importance of heating ordinances. S. H. Pool. Dom Eng 69:292-4 D 5 '14 Legislation affecting the heating industry. C: K. Foster, Heat & Ven 12:40-3 Ag '15 Omaha ordinance governing furnace work. Metal Work 84:330-1 S 10 '15

### Rates

See Hot water heating-Rates

### Tables, calculations, etc.

Air changes and direct radiation. Dom Eng 73:108-9 O 23 '15
Can we locate the neutral zone in heated buildings? J. J. Blackmore. diags Heat & Ven 12:27-32 N '15
Chart for direct-heating requirements. A. M. Daniels. Power 42:89-90 Jl 20 '15
Computing heating surface for brooder house. Metal Work 84:391+ S 24 '15
Condensation in hot-blast heaters. J. D. White. Power 41:128 Ja 26 '15
Data on overhead steam heating. I. N. Evans. Heat & Ven 12:41-2 S '15

Design of indirect heating systems with respect to maximum economy of operation, F. L. Busey and W. H. Carrier. Am Soc Heat & V E 19:141-65 '13

Design of warm air heating systems. W. F. Colbert. Metal Work 83:219-20 F 5 '15

Designing of warm air heating systems. R. E. Lynd. plans Metal Work 83:192-7 Ja 29 '15

Drill room, University of Illinois, requires 23,000 square feet of direct radiation. G: B. Rice. il diags Heat & Ven 12:13-23 S '15

Effect of time in determining radiatiom. J: R. Allen. Heat & Ven 11:23-7 F '14; Same; with discussion. Am Soc Heat & V E 20:112-23 '14

Engineering data for furnace heating; design of warm air systems now being based on thermal unit. A. C. Willard. Metal Work 83: 604-6+ Ap 23 '15 Establishment of a standard for transmission losses from buildings of all constructions. R. P. Bolton. Heat & Ven 12:19-23 J1 '15; Same. Dom Eng 73:264-6 N 27 '15 Heat emission from radiators. E: D. Bottsford. Heat & Ven 12:49 S '15 Heat emitting capacity of radiation. C: D. Allan. Heat & Ven 12:32-4 Ag '15 Heat from radiators under different temperatures. C: A. Fuller. Heat & Ven 12:32-5 Mr. '15

Heat loss test in a 200-room building. Heat & Ven 12:17-19 F '15
Heating data for varying conditions. J. A. Donnelly. Heat & Ven 12:28-33 Jl '15
Hot water heating radiation formula. N. J. Serrill. Metal Work \$1:395 S 3 '15
How to figure radiation for steam and hot water heating. Dom Eng 73:209-10 N 13 '15
Lecture course on elements of heating. C: A. Fuller. diags Metal Work \$3:927 Je 25 '15
Modern practice in heating and ventilation. A. G. King. diags Dom Eng 72:2-4 Jl 3 '15
New friction head slide rule for heating work and power piping. diags Heat & Ven 12:50-1

and power piping. diags Heat & Ven 12:50-1

New pipe chart and tables based on square feet of radiation. T. W. Reynolds. Heat & Ven 12:22-5 N '15

Ven 12:22-5 N '15
Problem of figuring radiation. Dom Eng 73:
107-8 O 23 '15
Records for two factory buildings and a Y. M.
C. A. building. S. R. Lewis. Heat & Ven 12:
20-2 Ag '15
Rules for figuring hot water radiation. A. J.
Lowndes. Metal Work 84:618-19, 674 N 12,
26 '15

26 '15
Rules for figuring radiation and sizes of mains.
Dom Eng 72:320 S 11 '15
Rules for warm-air furnace installation. Metal
Work 81:488-91 O 15 '15
Short method calculating glass surface. E. M.
Shealy. Dom Eng 72:286 S 4 '15
Size of fire pot. Metal Work 84:561, 620-1 O 29,
N 12 '15
Standard methods of proportioning the standard met

Standard methods of proportioning direct ra-diation and standard sizes of mains. J. A. Donnelly. Dom Eng 72:366-8; 73:2-4 S 25-O

Suggested formula for calculating the necessary amount of radiation for heating rooms by hot water, particularly applicable to the heating of all-gas kitchens, by hot water from a furnace coil or a water heater; with discussion. J. A. Donnelly. Am Soc Heat & V E 20:294-8 '14

Theory and practice in warm-air heating. Metal Work 83:772-3; 84:47-9, 109-10, 184-5, 203-4, 242-3, 451-3, 558-9 My 28, Jl 9, 23, Ag 6-20, O 8, 29 '15

Time analysis in starting heating apparatus; with discussion. R. C. Taggart. Am Soc Heat & V E 19:292-308 '13

Trunk-line system heats Michigan bungalow, il plans Metal Work 84:436-7 O 1 '15

Variation of temperature at different room Suggested formula for calculating the neces-

Variation of temperature at different room levels in furnace testing, R. L. Lynd. Heat & Ven 12:47-8 My '15

Warm-air trunk line system for residence. il plans Metal Work 84:647-8 N 19 '15 See also Heating pipes; Steam flow

## Terminology

Air return systems as a standard designation. Heat & Ven 12:50 Ag '15

Heating and ventilating engineers, American so-ciety of. See American society of heating and ventilating engineers

Heating apparatus

Heating devices at Panama exposition. Metal Work 83:871-2 Je 18 '15
Time analysis in starting heating apparatus; with discussion. R. C. Taggart. Am Soc Heat & V E 19:292-308 '13

See also Heaters

Heating boilers. See Boilers, Heating

Heating contracts
Responsibility under contract for fixtures and plumbing. Dom Eng 70:40 Ja 9 '15

Heating engineers

Definite recommendations for improving the status of the heating engineer. Heat & Ven 12:21-7 O '15

Heating from central stations

Central heating with forced hot water. il plans Metal Work 84:139-40+, 177-8 Jl 30-Ag 6 '15 Combination electric heating plant, Laramie, Wyo. A. E. Anderson. il Power 42:602-5 N 2 '15

Wyo. A. E. Anderson. 11 Power 42:602-5 N 2 '15
Commercial end of the heating business. C. F. Oehlman. Metal Work 84:392-4 S 24 '15
District heating. S. M. Bushnell and F. B. Orr. plans maps Heat & Ven 12:27-37 Ja; 32-7
F; 36-42 Mr; 37-41 Ap; 36-41 My; 28-33 Je '15
District-heating service and sales. Elec W 65: 1576-7 Je 12 '15
District heating with open heater. T: Wilson. il plan Power 42:44-7 Jl 13 '15
Flexible central-heating system. H. A. Woodworth. plan Elec W 65:937 Ap 10 '15
Hot water heating on a large scale; central heating plant for the State school of agriculture, Farmingdale, Long Island. il diags plans Heat & Ven 12:13-22 N '15
Laying district heating service mains. Metal Work 84:459-61+ O 8 '15
Locating overloaded sections in a central-heating system. H. A. Woodworth. Elec W 65:1123-4 My 1 '15
National district heating association 7th annual convention. Elec it & W Elec'n 66:1117-20 Je 12 '15
National district heating association 7th annual convention. Chicago, June 1-3 Heat

20 Je 12 '15
National district heating association 7th annual convention, Chicago, June 1-3. Heat & Ven 12:37-45 Je '15
Power plant of the Hughes electric co. C. P. Larsen. il Power 41:734 Je 1 '15
Trouble in combining two- and single-pipe systems. R. S. Hawley. diag Power 42:487-8

0.5

Heating industry

Annual congress of the trade. Dom Eng 69: 415-35+; 70:13-15 D 26 '14, Ja 2 '15

Classifying a heating system. J. A. Donnelly. Metal Work 84:57 J1 9 '15

Goods that give service which draws trade. il Metal Work 83:27-36 Ja 1 '15

Heating industry in Canada. N. A. Hill. Am Soc Heat & V E 20:365-9 '14; Same. Dom - Eng 69:321-2 D 12 '14; Discussion. Am Soc Heat & V E 20:369-73 '14

Manufacturers and aggressive sales seekers. il Metal Work 83:14-25 Ja 1 '15

Where to dig for fall profits, il Metal Work 84: 267-71 Ag 27 '15

See also Furnace industry

Heating pipes
Chart for determining size of pipe for gravity
hot-water heating systems; with discussion.
M. S. Cooley. Am Soc Heat & V E 19:377-90
'13

onduits and insulation for heating pipes. C: L. Hubbard. diags Dom Eng 72:252-3 Ag 28 '15 Conduits

Determination of pipe sizes for hot water heating systems. F. E. Giesecke. il diags Dom Eng 73:166-8, 201-4 N 6-13 '15

Inadequate space for heater pipes. T. R. Brien. Metal Work 84:402 S 24 '15

See also Furnaces, Hot air—Pipes and fit-tings; Steam pipes

Heddles

eddles for weaving broad silks. Textile World 50:213 N '15 Heddles

Hedfield, George, d. 1826 Old City Hall, Washington, D. C. H. F. Cun-ningham. il diag Arch Rec 37:268-73 Mr '15

Heliotropism

Recent studies in the dynamics of living matter, D. W. Thompson. Sci Am S 80:301 N 6

Helium

Notes on the noble gases. W. S. Andrews. Gen Elec R 18:226 Mr '15 Hell Gate bridge. See New York (city)-Bridges

Helmets Fibre helmet for welders. il Foundry 43:380 S

Manufacture of steel helmets for the French soldiers. J. Boyer, il Sci Am 113:468-9 N 27 '15

Hemicellutase

on the hemicelluloses and its commercial application to brewing. C: B. Davis, il J Ind & Eng Chem 7:115-18 F '15

Hemlock

Eastern hemlock, E. H. Frothingham, il map U S Agric Bul 152:1-43 '15

Test of long-submerged hemlock timber. T. R. Lawson. il Eng N 73:159 Ja 28 '15

Flax and hemp supply. C: R. Dodge. Textile World 48:475-8 F '15 Growing hemp in America. C: R. Dodge. il Sci Am S 79:308-9 My 15 '15

Hen houses. See Poultry houses

Heredity

amily resemblances. Sci Am S 80:331 N 20 '15 Heads and tails and heredity. E. Borel, il diags Sci Am S 78:403-5 D 26 '14 See also Plant breeding

Herschel fall increaser

Latest design of the Herschel fall increaser. C. Herschel. Eng N 73:84 Ja 14 '15

Hertzian waves. See Electric waves

Hetch Hetchy project. See San Francisco—Water supply

Hewitt, Peter Cooper, 1861-Sketch. por Eng M 50:218-19 N '15

Hexabromodiacetyl Hexabromodiacetyl, C. L. Jackson and Adams, Am Chem Soc J 37:2522-36 N '15

Hexyluracil

Researches on pyrimidines; the synthesis of 4-hexyluracil and its relationship to uracil-glucoside. T. B. Johnson. Am Chem Soc J 36:1891-9 S '14

Hibbing, Minnesota

Plucking the goose as town policy. Eng & Min J 100:877-8 N 27 '15

Hickory

Hickories, elm and ash trees. W. H. Miller. il Am For 21:719-29 Je '15

Hickory trees threatened with destruction. J. J. Levison. il Am For 21:797-9 Jl '15

High buildings Chicago's 1914 progress in building, il Bldg Age 37:46-8 F '15

Foundation work and the skyscraper. Sci Am 112:560 Je 5 '15

Heating the skyscraper and its problems; abstract. W: H. Driscoll. Heat & Ven 12:44-5 Ja

L. C. Smith building, Seattle, Wash. il plan Arch & Bldg 46:471-5 D '14

Problem of the high building. C: P. Warren. Sci Am S 79:368 Je 5 '15

Wind stresses in the steel frames of of buildings, W. M. Wilson and G. A. Mar tables Ill U Eng Exp Sta Bul 80:1-88 '15 office See also Office buildings; also Equitable uilding, New York; Woolworth building,

building, New York

High schools Recent tendencies in high school chemistry. R. H. Bradbury. J Fr Inst 180:449-61 O '15

High temperature. See Temperature, High

Highway accounting
Cost keeping system for work performed
by municipal forces of the Philadelphia
bureau of highways. Eng & Contr 43:292-4
Mr 31 '15; Same cond, Eng Rec 71:360-1
Mr 20 '15
Cost keeping system Oregon state highway
commission, E. F. Ayres. Eng & Contr 44:
349-50 N 3 '15
Method of recording expenditures on account
of maintenance, Pennsylvania highway department. W: R. Main, Eng & Contr 44:134
Ag 18 '15

partment. W: R. Main. Eng & Contr 44:134
Ag 18 '15
1914 operations of the Philadelphia bureau of
highways and street cleaning. il Good Roads
n s 9:131-5 Ap 3 '15
Road-maintenance costkeeping in Pennsylvania. Eng N 74:250-3 Ag 5 '15
Simplified system of town highway accounts.
F. Buck. Munic Eng 48:56-7 Ja '15; Same
cond. Eng Rec 70:534 N 14 '14
Standard form for reporting costs of road construction. Eng & Contr 43:107 F 3 '15
System of highway accounting. S. D. Gilbert.
Eng & Contr 44:336-7 O 27 '15; Same. Good
Roads n s 10:199-200 O 2 '15

Highway administration

Application of the merit system to the appointment of road officials. P. S. Wilson. Eng & Contr 42:444 N 4 '14
Automobiles versus horses in road-work supervision. E. W. James. Eng N 73:769 Ap 22 '15

Co-operative road administration plan aided by post card bulletins. L. W. Allison. Eng Rec 71:143 Ja 30 '15
Determination of the justifiable outlay for specific cases of highway improvement. C. Richardson. Good Roads n s 10:196-7 O 2 '15
Discussion of the administrative and design features of highway bridge and culvert work. A. Marston. Eng & Contr 42:589-90 D 23 '14

work. A. Marston. Eng & Contr 42:589-90 D 23 '14
Economic factors all-important in rural highways. L. W. Page. Eng Rec 72:385 S 25 '15
Educational field for state highway departments. J. H. Pratt. Eng & Contr 43:230-1
Mr 10 '15; Abstract. Eng Rec 70:611 D 5 '14
Efficiency of highway organization. E. A. Stevens. Eng Rec 70:687-8 D 26 '14
Engineering investigation of New York highway work. Eng N 73:787-8 Ap 22 '15
Functions of the planning boards installed in the Bureau of highways and street cleaning, Philadelphia, Pa. W: H. Connell. Eng & Contr 44:187 S 8 '15; Same. Good Roads n s 10:168 S 11 '15
Gains made by state management of road construction and maintenance, J. E. Pennybacker. Eng Rec 72:189-90 Ag 14 '15
Good roads and the government. Sci Am S '8: 390 D 19 '14
Highway commission or highway commission-

Highway commission or highway commission-er? Good Roads n s 9:52 F 6 '15 Highway department records. Munic J 38:434 Ap 1 '15

Ap 1 '15

Highway program of Cook county, Illinois. il map Eng Rec 70:648-9 D 12 '14

Highway superintendent of Cook county, Illinois, simplifies filing system, map Eng Rec 72:473-4 O 16 '15

Highway work in Illinois, il Good Roads n s 8:205-10 D 5 '14

History and future of highway improvement.

L. W. Page. Good Roads n s 10:189-91 O 2 '15

How small communities may have good roads.
L. W. Page, il Sci Am 112:14-15 Ja 2 '15
Inspection and cost record system used on
road work in Cook county, Illinois. Eng &
Contr 43:206-7 Mr 3 '15
Inspection of state aid road construction in
Wisconsin. J. T. Donaghey. Eng & Contr 42:
462 N 11 '14
Iowa state highway bridges not too heavy. Eng
Rec 71:138-9 Ja '30 '15
Need, preparation and utility of statistical
records in a highway department. P. P.
Farley. Eng & Contr 44:187-9 S 8 '15
Organization and standards of the Pennsylvania state highway department, il diags
Eng & Contr 42:186-93 Ag 19 '14
Organization and standards of the Wisconsin

Organization and standards of the Wisconsin highway commission, il diags Eng & Contr 42:398-403 O 28'14

Organization and system in highway work. A. B. Fletcher. Good Roads n s 10:197-9 O 2

Organization, character of personnel, scope of work, and methods of operation and control of a large municipal highway department. W: H. Connell. il map J Fr Inst 179: 439-69 Ap '15

diags Eng & Contr 42:504-8 N 25 '14 Organization for and methods and cost of state aid road construction in Alabama. il diags Eng & Contr 42:504-8 N 25 '14 Organization of a state highway department. W. R. Jeffreys. Good Roads n s 9:238 Je 5

'15
Organization of a state highway department; with discussion. J: N. Carlisle. Good Roads n s 9:53-5 F 6 '15
Organization of road work under the Illinois highway commission. il map Eng & Contr 43:468-72 My 26 '15
Progress in highway administration. J. E. Pennybacker, Eng Rec 71:15-16 Ja 2 '15
Progress of state management of public roads. J. E. Pennybacker, Eng & Contr 44:133 Ag 18 '15

Relation of farm produce hauling to permanent road improvements. W. A. McLean. Eng & Contr 42:215-17 Ag 26 '14
Road legislation and economics. J. E. Pennybacker. Eng & Contr 42:521-2 D 2 '14; Same cond. Munic Eng 48:49-50 Ja '15
Road-maintenance costkeeping in Pennsylvania. Eng N 74:250-3 Ag 5 '15
State road laws should centralize authority. A. N. Johnson. Eng Rec 72:351 S 18 '15
Uniform system for highway statistics and data. H. E. Breed. Eng & Contr 44:233-6 S 22 '15; Same. Good Roads n s 10:257-9 N 6 '15

Washington's state highways and highway department. W: R. Roy. il Munic J 39:343-9 S 2 '15

See also Highway accounting; Highway law; Roads—Maintenance and repair

Highway bonds. See Roads-Finance

Highway engineering
Promoting engineering work, B. K. Coghlan.
Eng Rec 72:301-2 S 4 '15
Short college courses in highway engineering
or annual meetings of state associations of
highway engineers; which is the better plan?
Eng & Contr 43:45 Ja 20 '15

See also Bridges; Pavements; Roads

Highway law

Changes in the Illinois road law. Munic Eng

Earth and gravel road construction and maintenance. I. O. Baker. Good Roads n s 9:71-3

Essentials of proper laws for highway work, A. N. Johnson. Good Roads n s 10:193-4 O 2 '15

Essentials of proper laws for highway won E. A. Stevens. Good Roads n s 10:191-3 2 '15

2' 15.

Highway laws of the United States. Good Roads n s 10:83-97 Ag 7' 15.

Location and width of highways and the securing of rights-of-way. A. B. Fletcher. Eng & Contr 42:523-4 D 2' 14; Same cond. Eng Rec 70:568 N 21' 14

Notes from state highway departments. Munic J 38:429-31 Ap 1' 15

Provisions of the new highway law of Ohio. Eng N 74:492-4 S 9' 15

State should deal directly with patentees of processes and materials in public work. S. Whinery. Eng Rec 72:73-4 Jl 17' 15

Traffic; present tendencies, probable development and regulation. A. W. Dean. Good Roads n s 9:55-6 f 6' 15

Wisconsin legislature makes changes in state

Wisconsin legislature makes changes in state highway laws, Good Roads n s 10:176-7 S 25

See also Automobiles—Laws and regulations; Highway administration; Jitney buses—Regulation; Road traffic; Street traffic

Highway officials

Directory of state highway officials. Good Roads n s 10:17-20 J1 3 '15

See also American association of state highway officials

Highways. See Roads; Streets

Hill publishing company
Hill building: special building design for special use, il diags plans Eng N 72:1241-8 D 24

Hippuric acid
Researches on hydantoins; the interaction of
hippuric acid with thiocyanates. T. B. Johnson, A. J. Hill and B. H. Bailey. Am Chem
Soc J 37:2406-16 O '15

Historic houses Early architecture of the valley of the Rappa-hannock. F. C. Baldwin. il diags plans Am Inst Arch J 3:113-18, 234-40 Mr, Je '15

Hobbing

Holbing operation performed on a Cleveland automatic, il diag Mach 21:524 F '15 Hobbing small gears on the milling machine, diag Mach 21:406 Ja '15

Hobs

Fawcus herringbone gear hobbing machine, il diag plan Mach 21:506-9 F '15 Lees-Bradner hyperboloid hob. il Mach 22:66-7 S '15

Results obtained with ground hobs. E: K. Hammond. il diag Mach 21:695-700 My '15 Hocking Valley railway
16th annual report. Ry Age 59:590-1, 626-7 O 1

Hogs. See Swine

Hoist towers

Portable hoist towers for concreting, il diag Eng N 72:1312-13 D 31'14

Hoisting

Care and use of hoisting accessories: wire rope, manila rope, hooks, chains, accessories, lubrication of wire rope, strength of slings. Mach 21:297-8 D '14 Experiments to determine stresses in parts of rope falls. C. S. Adams. Eng Rec 72:425-6 O 2 '15

Heavy truck and rigging used to install 48-ton

Heavy truck and rigging used to install 48-ton armatures. il Eng Rec 71:786 Je 19 '15 How a washed-out bridge-span was pulled out of a river. plan Eng N 73:634 Ap 1 '15 Outrigger on gin-pole saves time in erecting roof steel. W: H. Palmer. diag Eng Rec 71: 210 Mr 6 '15 Riley safety wrecker yoke. il Ry Age (Mech ed) \$9:517 O '15

ed) \$8:317 O '15 Seventy-nine-ton derrick car lowers itself 50 feet in twenty-five minutes, A. S. Beale, il Eng Rec 72:78-9 Jl 17 '15 Skip with cable guides, J. Simmons, il Eng & Min J 100:516 S 25 '15 Special hoisting job, il diags Eng N 74:606-7 S

23 '15 Steel-wire hoisting ropes; rule for finding the load stress and the required diameter. F. W. Sperr. Colliery 35:606-7 Je '15 Use of slings in handling loads, diags Eng & Contr 42:338-9 O 7 '14

See also Crane hooks; Hoist towers; Mine hoisting

Hoisting machinery

loisting machinery
Alternating-current coal hoist. R. E. Brown.
il Am Inst E E Pro 34:615-22 Ap '15; Abstract, with discussion. Elec R & W Elec'n 66:781-2 Ap 24 '15; Discussion. Am Inst E E Pro 34:2895-914 N '15
Compact spud hoist eliminates costly equipment. il Eng Rec 72:679 N 27 '15
Electrical appliances for workshops. il diags
Engineer 119:620-2; 120:40-1, 54-6 Je 25, Jl 9-16 '15
Erecting 40-ton girdore at

Frecting 40-ton girders at a height of 250 feet above the street, il diags Eng Rec 70: 699-702 D 26 '14 Erecting 36-ton girders with steel shears, il

699-702 D 26 14

Erecting 36-ton girders with steel shears. il

Eng Rec 70:606 D 5 '14

Features of the electrical equipment for the

Granite mountain hoist. G. B. Rosenblatt.
il diag Assn Eng Soc J 54:199-209 My '15

French electric mine hoist, il Colliery 35:468-

French electric mine holst, il Colliery 35:468-70+ Ap '15
Hamilton electric incline railway, il Elec Ry J 46:115-16 Jl 17 '15; Same. Eng N 74:49-51 Jl 8 '15; Same. Ry R 57:213-14 Ag 14 '15
Hamilton incline railway, il Munic J 39:41-2

JI 8 '15 Hoist for reinforcing-steel. H. DaCamara. diag Eng N 73:395 F 25 '15

Hoist on revolving headframe operates drag-line, il diags plan Eng Rec 71:742-3 Je 12 '15 Line disturbance caused by special squirrel-cage and wound-rotor motors when start-ing elevators and hoists, J. C. Lincoln, diag Am Inst E E Pro 34:421-31 Mr '15; Dis-cussion, 34:2847-50 N '15 Men and machinery of the Comstock—pioneer hoisting works, G. W. Dickie, il Eng & Min J 98:1130-4 D 26 '14 Rational basis of comparison of the duties of electrical elevators and hoisting engines.

Rational basis of comparison of the duties of electrical elevators and hoisting engines. A. M. Coyle. Am Soc M E J 37:395-400 Jl '15 Theory of the bucket elevator. L. Kresser. Eng & Min J 100:478-9 S 18 '15 Using a pneumatic drill motor as a hoisting engine. V. T. Kropidlowski. diag Ry Age 59:960 N 19 '15

See also Buckets; Cableways; Conveying machinery; Cranes, derricks, etc.; Electric shovels; Elevators; Lifting magnets; Mine hoisting; Mining machinery; Ore handling;

### Control

Alternating-current controllers for steel mills.

Alternating-current controllers for steel mills.

A. Simon. diag Am Inst E E Pro 34:748-9 My '15; Same. Iron Tr R 57:529 S 16 '15
Control of direct current hoists in iron and steel mills. G. E. Stoltz and W. O. Lum. il diag Am Inst E E Pro 34:723-9 My '15; Discussion. 34:2947-65 D '15

Cussion. 34:3947-65 D 13
Direct-current control for hoisting equipment in industrial plants. W. T. Snyder, diags Am Inst E E Pro 34:695-710 My '15; Same (How to buy hoist controllers). Iron Tr R 56:871-4+ Ap 29 '15; Same cond. Engineer 120: 208-10 Ag 27 '15; Abstract, with discussion. Elec R & W Elec'n 66:780-1 Ap 24 '15; Discussion. Am Inst E E Pro 34:2947-65 D '15

Direct-current hoist equipment in industrial plants; discussion at meeting of A. I. E. E. Elec W 65:1124 My 1 '15

Electric hoists for the Michigan iron country. il Eng & Min J 99:742 Ap 24 '15

Holding companies

Consolidation of balance sheets in holding company accounting, A. W. Wright, J Account 19:21-33 Ja '15

Holiday printing. See Christmas printing

Holidays

Misusing holidays, H. D. Murphy, Iron Age 95:512 Mr 4 '15 95:512

Hollow tile

Hollow-tile partitions and floor arches tested. diags Eng Rec 71:432 Ap 3 '15

Interlocking tower of stucco on hollow tile, Rock Island lines. E. G. Zorn. il diags Ry R 57:108-9 Jl 24 '15

Lateral strength of hollow-tile walls; tests at St. Louis. il diags Eng N 73:428-9 Mr 4 '15 Tile cottage with shingle roof. C: E. Anderson. il plans Bldg Age 37:19-24 O '15

Two-family house built of hollow tile. Zorn. il plans Bldg Age 37:47-52 Jl '15 E. G.

Holmes, Joseph Austin, 1859-1915 Sketch. por Iron Age 96:171 Jl 15 '15; Eng & Min J 100:119 Jl 17 '15; Eng N 74:188-9 Jl 22 '15; Sci Am 113:82 Jl 24 '15; Power 42:134-5 Jl 27 '15; Colliery 36:42-3 Ag '15; Met & Chem Eng 13:519-20 Ag '15

Sketch, V. H. Manning, por J Ind & Eng Chem 7:712-15 Ag '15

Home market club Annual meeting, Nov. 18, 1914. Textile World 48:302-4 D '14

Hominy Lye hulling of corn for hominy, J. W. Marden and J. A. Montgomery. J Ind & Eng Chem 7:850-3 O '15

Hooke's law Generalized form of Hooke's law, E. R. Hedrick. Eng N 74:542-3 S 16 '15

Hookworm disease Rural school and the hook Sci Am S 79:164-5 Mr 13 hookworm disease, il

Hoover, Herbert Ciark, 1874-Sketch; abstract. W. Irwin. Eng & Min J 99: 243-4 Ja 30 '15

Horsepower

Constants for converting electrical units to horsepower. C: S. Ohrenschall. Mach 21:794 Je '15

Power formulas used for taxation in different countries, Automobile 32:160-1 Ja 21 '15 Relation of the horse-power to the kilowatt. Sci Am S 79:162-3 Mr 13 '15

See also Automobile engines-Horsepower

Horses

German war diet for horses. Sci Am 112:422-My 1 '15

Horseshoes

Manufacture of a toe calk for horse shoes. il Iron Age 96:805 O 7 '15

Horticulture

Waste heat to stimulate plant growth. Sci Am 113:445 N 20 '15

Hose

Care of fire hose. Munic J 37:888 D 17 '14 Woven fabric for fire hose. il Textile World 49:425-6 Jl '15

Hose couplings

Ose couplings
Coupling for compressed air hose, il Iron Age
96:83 Jl 8 '15; Elec Ry J 46:194 Jl 31 '15;
Foundry 43:329 Ag '15
Dimension standards for brass hose couplings.
P. W. Blair, Metal Ind n s 13:111 Mr '15
National standard hose couplings and fittings
for public fire service, il diags U S Bur
Stand Circ 50:1-23 '14; Summary, Sci Am S
79:304 My 8 '15
Standard hose couplings, Munic, L 39:580 O 14

Standard hose couplings. Munic J 39:580 O 14

Hosiery

Aniline black on cotton hosiery. E. C. T. Bick. Textile World 48:523-4 F '15
Garter loop stocking. il diags Textile World 49:111-12 Ap '15
Improved stocking. diags Textile World 48:340-2, 617; 49:676-7 D '14, Mr, S '15
Manufacture of athletic hose. il Textile World 48:419-20 Ja '15
Merchandising of hosiery and underwear. C. C. Parlin. Textile World 49:sup265+ My '15
Paramount metal forms for hosiery. Textile World 48:339-40 D '14
Pointex full fashioned heel. diag Textile World 49:5447-18 Ja '15
Reinforced knit fabric. diags Textile World 49:544-6 Ag '15.
Removing stockings from boards, il Textile World 50:104-6 O '15
Straight hosiery frame. diags Textile World 49:673-4 S '15
Thirty years' retrospect and prospect of hosiery. F. L. Chipman. Textile World 48:515-18
F '15
Weights of hosiery. Textile World 49:546; 50: Weights of hosiery. Textile World 49:546; 50:

109 Ag, O '15

Hosiery machines Fancy hosiery

osiery machines
Fancy hosiery on full fashioned machines.
diags Textile World 49:674-5 S '15
Proctor automatic boarding, drying and stripping machine for hosiery. il Textile World
49:282 My '15
Seamless stocking machine. W. T. Wallis. Sci
Am 113:271 S 25 '15

Hospital cars

Ambulance train on a British railway. il Eng
M 48:876-8 Mr '15; Eng N 72:1203 D 17 '14

Exchange of severely wounded prisoners. il
Sci Am 113:285 O 2 '15

Turning French freight cars into hospitals.
W. S. Hiatt. il Ry Age 59:329-30 Ag 20 '15

War hospital cars in Germany. il Elec Ry J 45:
50-1 Ja 2 '15

See also Hospital trains

Hospital ships

Floating hospitals of Europe. A. Gradenwitz. il Sci Am 113:298-9 O 2 '15

Hospital trains
 How French hospital trains help to save the wounded. W. S. Hiatt. il plans Ry Age 59: 639-42 O 8 '15

See also Hospital cars

Hospitals

American hospital development. E: F. Stevens. il plans Arch Rec 38:641-61 D '15 Highland private hospital, Fall River, Mass.; views and plans. Brickb 23:pl 180-1 D '14

Hospital signal-lighting system. diag Elec W

66:1219 N 27 '15 Importance of background in the operating theatre. B. Moynihan. Illum Engr 8:462 N

New General hospital at Cincinnati. J. R. Schmidt, il plan Arch Rec 37:453-63 My '15
Practical suggestions for planning and equipment of hospitals. M. E. McCalmont. il plans Brickb 24:67-70 Mr '15
Ward-cooling plant in a hospital. A. M. Feldman. il plans Am Soc Heat & V E 20:74-9 '14; Same. Metal Work 81:336-8 F 27 '14; Same cond. Heat & Ven 11:21-3 F '14
Warren state hospital power plant. W. O. Rogers. il diags plan Power 42:364-5, 408-12 S 14-21 '15

See also Convalescent homes; Tuberculosis, Hospitals and sanatoriums for

Electric equipment

Scottish hospital installation. Elec R & W Elec'n 67:337 Ag 21 '15 Wilkes-Barre hospital contract. Elec R & W Elec'n 66:199 Ja 30 '15

Heating and ventilation

Heating and ventilation hospital building. C: L. Hubbard. il plans Metal Work 83:630-1 Ap 30 '15
Hospital ventilation from the engineer's point of view. A. K. Ohmes. Heat & Ven 11:22-7 D '14

Plumbing and heating in Burke home, il plans Metal Work 83:595-8 Ap 23 '15 Plumbing and heating in Cincinnati hospital, K. C. Cardwell, il plan Dom Eng 71:212-14 My 22 '15

### Sewerage

Design, cost and operation of new sewage treatment plant at the state hospital, War-ren, Pa. P. E. Mebus and F. R. Berlin. plans Eng & Contr 43:265-8 Mr 24 '15

Hospitals, Factory
Shop hospitals, il Am Ind 15:sup1-4 Je '15

Hospitals, Military
American ambulances in the field. il Automobile 32:266-9 F 11 '15

See also Hospital cars; Hospital ships; Hospital trains

Hot air engines. See Air engines

Hot blast stoves. See Blast furnace stoves

Hot Springs, Arkansas
Fordyce bath house. il plans Brickb 24:283-4
N '15

Hot springs. See Springs

Hot water heating
Advantage of down-feed hot water heating.
I. N. Evans. Heat & Ven 12:40 Ag '15
Auxiliary heating system. plan Dom Eng 73:
208 N 13 '15
Central heating with forced hot water. il
plans Metal Work 84:139-40+, 177-8 Jl 30Ag 6 '15
Chost for determining size of nine for gravity

Chart for determining size of pipe for gravity hot-water heating systems; with discussion.

M. S. Cooley. Am Soc Heat & V E 19:377-90

Combined heating and sprinkler system for a factory building; Wheelock, Lovejoy & co., Cambridge, Mass. C: L. Hubbard. il plans Heat & Ven 12:13-17 O '15 Comfort in a country mansion. il plans Metal Work 83:806-9 Je 4 '15

Determination of pipe sizes for hot water heating systems. F. E. Giesecke. il diags Dom Eng 73:166-8, 201-4 N 6-13 '15

District heating with open heater. T: Wilson. il plan Power 42:44-7 Jl 13 '15

Elizabeth hospital hot water heating plant. Heat & Ven 11:51-3 D '14

Flexible central-heating system. H. A. Wood-worth. plan Elec W 65:937 Ap 10 '15

Forced hot water heating system. Ediags Dom Eng 70:302-4 Mr 6 '15

Heat generators and velocity problems. Metal Work 82:759+ D 11 '14

Heating a garage, plan Metal Work 84:16-17 Jl 2 '15

Hot water heating Continued

Heating greenhouses by hot water. G: W. Loeber. diags Dom Eng 70:399-401; 71:31-3, 124-6, 244-5, 362-6 Mr 27, Ap 10, My 1, 29, Je 26 '15

Heating radiator from water back, il Metal Work \$1:251 Ag 27 '15

Work N1:2NI Ag 27 '15
Heating system for a garage, plans Dom Eng 72:375 8 25 '15
Hot water heating for mills, R. S. Parks, Textile World 50:240-3 N '15
Hot water heating on a large scale; central heating plant for the State school of agriculture, Farmingdale, Long Island, il diags plans Heat & Ven 12:13-22 N '15
Hot water heating radiation formula, N. J. Serrill, Metal Work 84:305 S 3 '15
Hot-water heating system at Grand Central terminal, W. G. Carlton, Power 42:245-6 Ag 17 '15
Hot water heating system for garages, il Dom

17 '15
Hot water heating system for garages. il Dom Eng 72:228-9 Ag 21 '15
Hot water radiators at boiler level. diags Metal Work 83:184-5 Ja 29 '15
Locating overloaded sections in a central heating system. H. A. Woodworth, Elec W 65:1123-4 My 1 '15
Divishing and heating in Burks home il plans

65:1123-4 My 1 '15
Plumbing and heating in Burke home, il plans
Metal Work 83:595-8 Ap 23 '15
Rules for figuring hot water radiation. A. J.
Lowndes, Metal Work 84:618-19 N 12 '15
Suggested formula for calculating the neces-

Suggested formula for calculating the necessary amount of radiation for heating rooms by hot water, particularly applicable to the heating of all-gas kitchens, by hot water from a furnace coil or a water heater; with discussion, J. A. Donnelly, Am Soc Heat & V E 201291-8 11

Time element in heating a building, Heat &

Yen 12:45-6 Mr '15
Two hot water supply problems, diags Dom
Eng 70:242-3 F 20 '15

#### Rates

New rate schedule for hot water heating in Toiedo, Ohio. Heat & Ven 11:50-1 D '14

Hot water supply
Barber shop hot-water system. plan Metal
Work 84:466-7 O 8 '15
Combination hot water supply and hot water
beauting system, diags Dom Eng 73:111 O
30 '15

Connecting a range boiler to a tank heater and furnace coil, diags Dom Eng 72:288 S 4

Expansion in hot water supply pipes, il diags Metal Work 83:505+ Ap 2 '15
Explosion of hot-water tank, H. E. Collins, il diag Power 41:451-2 Mr 30 '15
Hot water supply system, diags Dom Eng 73: 170-1 N 6 '15

Hot water supply system that will not circulate diags Dom Eng 73:237-8 N 20 '15 Methods of range boiler connections. diags Dom Eng 71:159-60 My 8 '15

Pipe surface required for heating water. Power 41:209 F 9 '15 Plumbing installation and sewage disposal. C: A. Whittemore. il plans Brickb 24:137-40 C: A. Je '15

Je '15 Question about hot water supply connections, plan Dom Eng 72:345-6 S 18 '15 Range-boiler connections work right, diags Dom Eng 73:142 O 30 '15 Range boiler installation, plans Dom Eng 73: 74-5 O 16 '15 Sediment deposits in stove waterbacks, il Metal Work 84:205-7 Ag 13 '15 Unpatification, but water supply system for Metal Work 84:205-7 Ag 13 '15

Metal Work 84:205-7 Ag 13 '15

Unsatisfactory hot water supply system for barber shop, diags Dom Eng 72:289 S 4 '15

Water becomes too hot in range boiler. plans Dom Eng 73:207-8 N 13 '15

See also Electric water heaters; Gas water heaters; Water heaters

Construction work on Traymore hotel, Atlantic City, il plan Eng N 74:80-1 Jl 8 '15

From mangers to ballrooms; Gedney Farm Hotel, White Plains, N. Y. W. H. Cooley. il Arch & Bldg 47:85-8 Mr '15

Gedney Farms, White Plains, N. Y. Arch Rec 38:696 D '15

Hotels and fires. E: R. Hardy. Arch & Bldg

47:126-8 Mr '15 Reinforced-concrete frame of Hotel Traymore erected at rate of a floor a week, il plans Eng Rec 72:50-1 Jl 10 '15

Designs and plans

Hotel building, il plans Arch & Bldg 47:104-25 Hotel Statler, Detroit, Mich. Brickb 24:pl 50-3

Hotel Statler, Detroit, Mich. Brickb 24:pl 50-3 Ap '15
Hotel Statler, Detroit, Mich. il plans Arch & Bldg 47:89-101 Mr '15
Hotel Statler in Detroit. W. S. Wagner. il plans Arch Rec 37:320-39 Ap '15
Largest fireproof resort hotel in the world completed at Atlantic City. il diags Eng Rec 72:11-13 Jl 3 '15
New Traymore hotel at Atlantic City. il diags Eng N 74:18-23 Jl 1 '15

Heating and ventilation

Heating and ventilating modern hotels. N. L. Schloss. Power 42:212-13 Ag 10 '15 Kitchen ventilation for a modern hotel; equipment of the Biltmore, New York, il diags plan Heat & Ven 12:13-18 Ja '15

Lighting

Halation and hostelries. F. L. Godinez. Arch & Bldg 47:102-3 Mr '15

Power plants

Former engineer of La Salle hotel defends his administration. J. E. Lawrence. Power 41:63-5 Ja 12 '15

Large saving in Hotel La Salle plant. W. W. Bird. Power 41:99-101 Ja 19 '15 New Morrison hotel plant, Chicago. T: Wilson. il plans Fower 42:70-3, 111-15 Jl 20-27 '15 Hours of labor

Eight-hour day, C. J. Morrison, Eng M 50:363-

6 D 15

Hours of service act interpreted as to telephone communications. Ry Age 59:496-7 S

Many New England shops on shorter hours. Iron Age 96:850-1 O 7 '15 Work-day shortened and output maintained in forge shop of Cleveland hardware com-pany. Iron Age 95:537-8 Mr 4 '15

House decoration ouse decoration
Diffusing media; interior furnishings. Illum
Eng Soc 10:397-402 no 5 '15
Recent interiors by Thornton Chard; views.
Arch Rec 37:177-86 F '15
Use of native woods for interior finish. C. M.
Price. il Brickb 24:217-22, 239-42, 285-9 S-N

See also Fireplaces; Mantles; Mural painting and decoration

House drainage. See Drainage, House; Plumbing House flies. See Flies

Houses. See Apartment houses; Architecture, Domestic; Cottages; Country houses; House decoration; Housing problem

Houses, Concrete. See Concrete houses

Houses, Duplex. See Duplex houses Houses, Historic. See Historic houses

Houses, Steel
Steel frame houses for miners, il plans Colliery 35:566-8 My '15

Housewiring campaigns. See Electric service companies-Advertising

Housing problem
Canvastown for government employees in
New South Wales, il Sci Am 112:479 My 22

Ellen Wilson Memorial homes to be erected at Washington, D. C. G: B. Ford, il plans Am Inst Arch J 3:352-7 Ag '15

Factory city beautiful at low cost, Badir N. C. il plans Iron Age 95:782-6 Ap 8 '15

Housing and sanitation at Mineville. S. Lefevre. il diags plans Am Inst Min E Bul 98: 227-38 F '15

Housing reform in Belgium. C. Aronovici. il Am Inst Arch J 2:568-72 D '14 Housing reform in France. C. Aronovici. Am Inst Arch J 3:32-6 Ja '15

Housing problem —Continued

Housing reform in Italy, C. Aronovici, Am Inst
Arch J 3:89-93 F '15
Improvement in housing workmen; steps to be
taken by Pennsylvania, Bldg Age 37:63 Mr

Industrial betterment. F. E. Cardullo. Mach 22:193-5 N '15

See also Apartment houses; City planning; Garden cities

Houston, Texas

Bridges

Design and construction of the San Jacinto street reinforced concrete bridge, il diags Eng & Contr 42:492-5 N 25 '14

Electricity supply

Co-operative lighting franchise. P. H. Sheldon. Munic Eng 48:41-3 Ja '15

Railroads

Factors in grade separation. Eng N 73:422-3 Mr 4

Howitzers. See Guns (ordnance)

Hudson river

Long-term variations in stream flow, Croton and Hudson rivers. E: H. Sargent. Eng N 72:

Hughes induction balance
Detecting buried shells with induction balance.
Sci Am 113:425+ N 13 '15
Use of the Hughes induction balance for locating bullets, diag Elec W 65:167 Ja 16 '15

Hulling, See Corn

Humidity

umidity
Air conditioning; abstract, J. I. Lyle, Am Soc
M E J 37:296 My '15
Air we breathe—a study of temperature, humidity and dust content. T: Hubbard, Heat &
Ven 12:22-5 Ja '15
Control of humidity in pressrooms, Inland Ptr

55:675-6 Ag '15 Cooling water of condensation; introduction to a collection of psychrometric tables for cool-ing tower work. Textile World 49:692-4 S

Effect of relative humidity on an oak tanned leather belt. W: W. Bird and F. W. Roys. il Am Soc M E J 37:447-9 Ag '15; Same. Iron Tr R 56:1315-17 Je 24 '15; Same. Power 42: 169-71 Ag 3 '15; Summary. Iron Age 96:26-7 Jl 1 '15; Discussion. Am Soc M E J 37:449-51 Ag '15

Experiments on humidifying air at the Oliver Wendell Holmes school; with discussion. C: F. Eveleth. plans Am Soc Heat & V E 19: 109-27 '13

109-27 '13
Humidifying mine air. J. W. Reed. Colliery 35:330-2 Ja '15
Humidity control of warm air furnaces. C: E. Stewart. diag Metal Work 83:80 Ja 1 '15
Humidity of mine air. Colliery 35:302 Ja '15
Humidity of mine air. R. Y. Williams. il map U S Bur Mines Bul 83:1-63 '14
Lecture course on elements of heating. C: A. Faller. il Metal Work 84:430+, 583+ O 1, N

Measurements for the household. U S Bur Stand Circ 55:108-11 '15 Properties of saturated air. W. D. Ennis. Power 41:402-4 Mr 23 '15

Humins

Origin of the humin formed by the acid hydrolysis of proteins. R. A. Gortner and M. J. Blish. Am Chem Soc J 37:1630-6 Je '15

Humphrey pumps
First large American-built Humphrey pump.
C: C. Trump. il diags Power 40:767-70 D 1
14: Same. Eng N 7:1154-5 Ja 28 115;
Abstract. Ind Eng 15:26-7 Ja 15
Humphrey pump: recent developments. C: C.
Trump. il diags Sibley J 30:55-9 N 15

Irrigation by pumping at Del Rio, Texas, A. Potter, il diags plan Eng & Contr 43:66-71 Ja 27 '15; Same abr. Eng Rec 71:596-8 My 8 '15

Humphreys, Alexander C., 1851 President Humphreys, A. S. Miller, Stevens
 Ind 32:11-18 Ja '15

Hunt, Andrew Murray, 1859-Sketch. por Eng M 50:215 N '15

Hunting

Hunting on the national forests. H. A. Smith, il Am For 21:172-22 Mr 115

Huntington-Heberlein process Lead smelting at El Paso, H. F. Easter, Am Inst Min E Bul 104:1493-1506 Ag '15; Ex-cerpts. Eng & Min J 100:356-7 Ag 28 '15; Abstract, Met & Chem Eng 13:814 N 1 '15

Hunt's Point terminal. See New York (city)—Wharves

Hurricanes

Cause and prevention of storm erosion on Gulf coast. G. O. Case. il Eng N 74:1072-5 D 2 '15 Engineering aspects of New Orleans hurricane. W. H. P. Creighton. Eng N 74:710 O 7

Meteorology of West Indian hurricane, Sept. 22-Oct. 2. Eng N 74:710-12 O 7 '15 New Orleans record for succession of storms broken. map Eng Rec 72:562-3 N 6 '15

See also Galveston-Hurricane, 1915

Hybridization

ybridization Artificial production of vigorous trees. Sci Am S 79:150 Mr 6 '15 Experiments in hybridizing Japanese flowers. W. P. Jenny. Sci Am S 79:18-19 Ja 9 '15

ydantoins
Researches on hydantoins; a new method of
synthesizing glycocyamidine compounds, and
the conversion of glycocyamidine into isomers of creatinine. T. B. Johnson and B. H.
Nicolet. Am Chem Soc J 37:2416-26 O '15
Researches on hydantoins; a new synthesis
of o-tyrosine. T. B. Johnson and W. M.
Scott. Am Chem Soc J 37:1846-56 Ag '15
Researches on hydantoins: geometrical isomerism in the hydantoin series. T. B. Johnson
and S. E. Hadley. Am Chem Soc J 37:171-7
Ja '15
Researches on hydantoins; geometrical isomer-

esearches on hydantoins: stereoisomeric modifications of benzalhydantoin. T. B. Johnson and J. S. Bates. Am Chem Soc J 37; 383-5 F '15

Researches on hydantoins; synthesis of the hydantoin of 2-hydroxy-5-aminophenylala-nine. T. B. Johnson and W. M. Scott. An Chem Soc J 37:1856-63 Ag '15

Researches on hydantoins; the condensation of cinnamic aldebyde with hydantoins. T. B. Johnson and R: Wrenshall. Am Chem Soc J 37:2133-44 S '15

Researches on hydantoins; the interaction of hippuric acid with thiocyanates. T. B. Johnson, A. J. Hill and B. H. Bailey. Am Chem Soc J 37:2406-16 O '15

Researches on hydantoins; the synthesis of 1,3,4-trisubstituted hydantoins from diethyl anilinomalonate. T. B. Johnson and N. A. Shepard. Am Chem Soc J 36:1735-42 Ag '14

Hydrants
Care of hydrants in winter. P. Gear. Munic
J 38:106 Ja 28 '15
Cincinnati high-pressure fire hydrants. diags
Eng N 74:153 Jl 22 '15

Design details of the Cincinnati high pressure fire system, diags Eng & Contr 43:529-32 Je 16 '15

Equitable hydrant rentals and better methods for apportioning fire protection cost. J: W. Alvord. Am Water Works Assn J 1:95-102 Mr '14; Same. Eng & Contr 41:579-80; My 20 '14; Same. Munic J 36:850-2 Je 11 '14; Same cond. Eng Rec 69:586-7 My 23 '14; Discussion. Am Water Works Assn J 1:538-45, 697-703 S-D '14

Hydrant tests in Chicago indicate cheaper maintenance possibilities, il Eng Rec 71:483-4

Hydrant-thawing apparatus. il diag Munic Eng 49:117-18 S '15

Hydrates

Method of determining the hydrates formed by a salt. H. W. Foote. Am Chem Soc J 37: 288-92 F '15

Hydration

High-strength concretes produced through lowering of surface tension of mixing water, N. C. Johnson, il Eng Rec 71:320-4 Mr 13 '15

Hydration -Continued

Hydration of Portland cement. A. A. Klein and A. J. Phillips. pls U S Bur Stand Tech Pa 43:3-71 '14; Abstract. J Fr Inst 178:635-9

N '14 Mechanical features of the hydration of Portland cement and the making of concrete as revealed by microscopic study. N. C. Johnson. il Am Soc M E J 37:516-25 S '15; Abstract. Eng M 49:744-5 Ag '15; Discussion. Am Soc M E J 37:525-8 S '15

Hydration of ions. See Solution (chemistry) Hydraulic cartridge. See Hydraulic mining cart-

Hydraulic engineering

Concrete cnute drops water 130 feet from canal to reservoir, D. W. Cole, il diags Eng Rec 71:456-7 Ap 10 '15 San Francisco's notable engineering works, il Eng Rec 71:225-8 F 20 '15

il Eng Rec 71:225-8 F 20 '15

Sec also Aqueducts; Breakwaters; Bridges

—Foundations and piers; Caissons; Canals;
Channels; Cofferdams; Culverts; Dams;
Docks; Drainage; Dredges; Dredging; Dredging machinery; Embankments; Engineering;
Flood control; Flumes; Harbors; Hydraulic
excavation; Hydraulic machinery; Hydraulic
excavation; Hydraulics; Hydroelectric plants;
Irrigation; Levees; Pumping stations;
Pumps; Reclamation of land; Reservoirs;
Pumps; Reclamation of land; Reservoirs; Irrigation; Levees; Pumping stations; Pumps; Reclamation of land; Reservoirs; Rivers—Regulation; Sea walls; Surge tanks; Turbines; Water; Water flow; Water power; Water supply engineering; Water wheels; Wells; Wharves

Hydraulic excavation

Handling hydraulic fill on Piute dam. J. Jen-son. il diags Eng Rec 72:80-1 Jl 17 '15 Stripping of gravel pits by hydraulic methods. W. H. Wilms. diags Ry Age 58:1430-3 Je 18

Hydraulic machinery Banding projectiles. il diag Iron Age 96:466 Ag

Conradson hydraulically operated, six-spindle, vertical, automatic chucking, boring and turning machine. il Iron Tr R 56:920-2 My 6

Emergency hydraulic jack, diag Power 40:877 D 22 '14

Hydraulic press for bearing and bushing changes. E. L. Stephens. il Elec Ry J 46: 282 Ag 14 '15
Hydraulic shrapnel billet piercing press. il Mach 21:682-3 Ap '15
Hydraulic wheel and armature presses. Elec Ry J 46:323-4 Ag 21 '15
Increasing the output of hydraulic presses. Elec Ry J 46:1170 Je 19 '15
Machines for breaking pig iron. il Iron Tr R 56:1069 My 27 '15
Making tunnel shield jacks. il Iron Age 95:

Making tunnel shield jacks. il Iron Age 95: 502 Mr 4 '15

502 Mr 4 '15
75-ton self-contained hydraulic broaching and forcing press. il Ind Eng 14:401 O '14
Shell nosing and banding presses. il Iron Age 96:417 Ag 19 '15
60-ton hydraulic forcing press. il Iron Age 95: 1393 Je 24 '15

See also Hydraulic engineering; F machinery; Turbines; Water wheels Pumping

Hydraulic mining Bagley scraper for gravel mining in Alaska. L: H. Eddy. il Eng & Min J 100:257-8 Ag 14 '15

Comparative hydraulic-mining methods. L: H. Eddy. Eng & Min J 99:481-3 Mr 13 '15 Cost of hydraulic sand and gravel mining. R. J. Borhek. Eng & Contr 43:573-4 Je 30

Development methods at Fairbanks. H. I. Ellis, il diags Eng & Min J 99:1023-9 Je 12

Elevating placer tailings with a Hayward bucket. H. I, Ellis. Eng & Min J 100:309-10 levat... bucket. H 21 '15

bucket. H. I. Ellis. Eng & Min J 100:309-10
Ag 21 '15
Gold Bar hydraulic mine, Blewett, Wash. H. I.
Ellis. diags Eng & Min J 100:678-9 O 23 '15
Gold recovery at placer mines. D. F. Carver.
il Eng & Min J 100:472-3 S 18 '15
Hydraulic mining at Circle. H. I. Ellis. Eng
& Min J 98:1104-5 D 19 '14
Hydraulicking at Waldo, Ore. W. H. Wright.
il Eng & Min J 100:211-14 Ag 7 '15

Koyukuk placer-mining district. Eng & Min J 99:1021-2 Je 12 '15
Opportunity in placer mining. C. Hartley. Eng & Min J 99:185-8 Ja 23 '15
Placers of Antioquia, Colombia. R. W. Perry. il map Eng & Min J 100:585-9 O 9 '15
Rocker and grizzly mining on the north Saskatchewan. J. A. Macdonald. diags Eng & Min J 100:187-8 Jl 31 '15
Thawing methods at Fairbanks. H. I. Ellis. il diags Eng & Min J 100:1-6 Jl 3 '15
United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 941-5 '15

Yakataga beach placers. A. G. Thompson. il Eng & Min J 99:763-5 My 1 '15

See also Gold dredging; Gold mines and mining

Hydraulic mining cartridge
Hydraulic cartridge. J. Tonge, diag Eng M 49:
606 Jl '15

600 J1 15 Hydraulic mining cartridge for breaking rock, Eng Rec 71:28 Ja 2 '15 Mechanical device for use where explosives are impossible, J. Tonge, il diags Sci Am S 79:156-8 Mr 6 '15

Hydraulic motors

See also Turbines; Water wheels

Hydraulic power. See Hydraulic machinery; Hydroelectric plants; Water power

Hydraulic rams

Action of the hydraulic ram. plan Dom Eng 71:369 Je 26 '15

Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:284-6 S 4 '15

Hydraulic stowage. See Mine timbering

Hydraulic transmission
Hydraulic transmission, diags Horseless Age
35:234-5 F 17 '15

Hydraulic valves. See Valves, Hydraulic

Hydraulics

Circular sewers versus egg-shaped, catenary and horseshoe cross-sections. R. D. French. Eng Rec 72:222-3 Ag 21 '15 Comparing sewer sections. B: Brooks; R. S. Beard. 29 diags Eng Rec 72:608-10 N 13 '15 Constructing logarithmic charts for hydraulic formulas. L. G. Hall. Eng & Contr 44:31-2

J1 14 '15
Design of turbine draft tubes analyzed. A. G.
Hilberg. Eng Rec 72:604-7, 630-1 N 13-20 '15
Hydraulic jump, in open-channel flow at high
velocity; abstract. K. R. Kennison. Am Soc
M E J 37:655 N '15
Hydraulics of irrigation, drainage, and other
channels. L: Schmeer. Eng & Contr 42:28490 S 23 '14

Influence of disk friction on turbine pump design. F. zur Nedden, diags Am Soc M E J 37:538-44 S '15; Abstract. Int Marine Eng 20:366 Ag '15; Discussion. Am Soc M E J 37: 545-6 S '15

Logarithmic diagram plotting of hydraulic formulas. W. A. Lyon, Eng & Contr 43:239 Mr 17 '15 Mr 17

Models, properly designed, show correctly performance of dams and turbines. B. F. Groat. Eng Rec 72:377-8 S 25 '15

Nomographic charts for Kutter's for G. S. Coleman. Eng Rec 72:489 O 16

Relation of stream gaging to the science of hydraulics; abstract. C. H. Pierce and R. W. Davenport. Am Soc M E J 37:614 O '15

Table of circular and horseshoe conduit sections. Eng N 73:1182-3 Je 17 '15

Tests check computed values of surges; investigation at Tallulah Falls hydroelectric plant in Georgia indicate accuracy of formulæ commonly used. E. Lauchli. diag Eng Rec 71:378-9 Mr 20 '15

Transportation of débris by running water. R. T. Hancock. Eng & Min J 99:459-60 Mr 6 '15

See also Fluids; Hydraulic engineering; Hydraulic machinery; Hydrodynamics; Hydrometers; Nozzles; Rivers; Siphons; Stream flow; Stream measurement; Water; Water flow; Water power

Hydrazine

Action of monochloroacetic acid on semi-carbazide and hydrazine, J. R. Bailey and W. T. Read. Am Chem Soc J 36:1747-66 Ag '14 Chemical reactions in anhydrous hydrazine T. W. B. Welsh and H. J. Broderson, diags Am Chem Soc J 37:825-32 Ap '15 Electrolysis of a solution of sodium hydrazide in anhydrous hydrazine, T. W. B. Welsh, diag Am Chem Soc J 37:497-508 Mr '15

Hydrazine diperchlorate

Description of the new compound, hydrazine diperchlorate. J. W. Turrentine. Am Chem Soc J 37:1122-8 My '15

Hydrazine salts

Behavior of certain hydrazine salts on decomposition by heat. J. W. Turrentine. Am Chem Soc J 37:1105-14 My '15

Hydrazine sulfate
Electrochemical oxidation of hydrazine sulfate
and ammonium hydroxide. J. W. Turrentine
and J. M. Olin. Am Chem Soc J 37:1114-22
My '15

Hydrazinodiacetic acid New synthesis of iminoacetonitrile and its conversion to hydrazinodiacetic acid. J. R. Bailey and D. F. Snyder. Am Chem Soc J 37:935-42 An '15

Hydrocarbons

Action of chloral, bromal and benzaldehyde on the polycyclic hydrocarbons in the pres-ence of aluminium chloride. G. B. Frank-forter and W. Kritchevsky. Am Chem Soc J 37:385-92 F '15

J 37:385-92 F '15
Action of trioxymethylene on the various hydrocarbons in the presence of aluminum chloride. G. B. Frankforter and V. Kokatnur. Am Chem Soc J 37:2399-401 O '15
Estimation of aromatic hydrocarbons in cracked petroleum. W. F. Rittman. T. J. Twomey and G. Egloff. Met & Chem Eng 13:682-6 O 1 '15
Heats of combustion of aromatic hydrocarbons and hexamethylene. T. W. Richards and F: Barry. il Am Chem Soc J 37:993-1020 My '15

See also Azulene

Hydrochloric acid

Method for the precise standardization of
hydrochloric acid solutions, L. W. Andrews,
Am Chem Soc J 36:2089-91 O '14

Am Chem Soc J 36:2089-91 O 14
Modification of starch by gaseous hydrochloric
acid. F. C. Frary and A. C. Dennis. J Ind &
Eng Chem 7:214-16 Mr '15
Physiological activity of combined hydrochloric acid. J. H. Long. Am Chem Soc J
37:1333-47 My '15

Hydrocyanic acid

Determination of small quantities of hydrocyanic acid. A. Viehoever and C. O. Johns. Am Chem Soc J 37:601-7 Mr '15

Hydrodynamics

Suction between passing ships. S. A. Reeve. diags Sci Am S 79:30-2, 46-8 Ja 9-16 '15

Hydroelectric plants

Design of turbine draft tubes analyzed. A. G.

Hillberg. Eng Rec 72:604-7, 630-1 N 13-20

Developments in the hydroelectric field in 1914. D. W. Mead. Eng Rec 71:6-7 Ja 2 '15 Four years' operating experience on a high-tension transmission line. A. Bang. diags pls Am Inst E E Pro 34:1425-45 Jl '15 Hydroelectric development; with discussion. H: Flood, jr. Elec W 65:1267-9 My 15 '15 Hydro-electric plant at a Bolivian tin mine. M. R. Lamb. il Eng & Min J 99:7-9 Ja 2 '15 Ice fighting is systematized at Holtwood hydroelectric plant. F. A. Allner. il diag map Eng Rec 72:66-8 Jl 17 '15

Intermittent waterfall; using the power of Niagara falls without impairing its scenic beauty. E. Dunn. il Sci Am 113:492-3+ D 4

perating hydro-electric plants without attendants, J. M. Wanchope, Power 41:407 Operating without

Operating results in a hydroelectric plant. Elec R & W Elec'n 66:310 F 13 '15

Outdoor hydroelectric generating plant, diags plan Elec W 66:689 S 25 '15

Severe frazil ice attack at Holtwood plant does not disturb service. F. A. Allner, il diag Eng Rec 72:113-15 Jl 24 '15 Tail-tunnel regulation suggests new oppor-tunities in hydroelectric field. R. D. John-son. Eng Rec 71:380 Mr 20 '15 Ten years' progress in the development of hy-droelectric units. E: B. Ellicott and W: B. Jackson. Elec R & W Elec'n 66:1004 My 29 '15

Use of special gates to prevent ice formation at intake screens. il Elec W 66:1030-1 N 6 '15. See also Dams; Electric transmission; Surge

Auxiliary plants

Auxiliary plants

A. I. E. E. discuss supply of energy from hydroelectric stations supplemented by supply from steam stations. Elec W 66:848 O 16 '15

Auxiliary steam plant of the Vancouver Island power company. H. W. Beecher. Il plans Elec R & W Elec'n 67:373-8 Ag 28 '15

Auxiliary steam power plant for Vancouver island; steam turbine driven plant using oil fuel. W. L. Kidston. il plan Power 42:634-8

Compliend evention.

N 9 15 Combined operation of steam and hydraulic power in the Pennsylvania water and power company system. J: A. Walls. Am Inst E E Pro 34:2299-306 O 15

Electrical engineers hold hydro-electric ses-sion. Power 42:598 O 26 '15 Hydroelectric problems considered at Philadel-

Hydroelectric problems considered at Philadelphia meeting of American institute. Elec R & W Elec'n 67:763 O 23 '15 Owego, N. Y., light and power plant. G. Newell. il plan Power 42:757-8 N 30 '15 Selling current on a small margin; a small water and steam plant. T. Wilson. il diags Power 42:498-501 O 12 '15 Stand-by plant supplying steam to central heating system. G. Eroili. Power 41:726 My 25 '15.

Supplemental power for hydroelectric systems, J. F. Vaughan. Am Inst E E Pro 34:2307-19 O '15

Construction elements of the Tallulah Falls development. C: G. Adsit and W. P. Ham-mond. il diags Am Inst E E Pro 34:2497-546. O '15; Abstract. Elec W 66:916-18 O 23 '15

## Testing

Color used in hydraulic tests of power plants. R. Taylor, diags Eng N 74:617-20 S 23 '15 Plant tests of a low-head hydro-electric development. F. Nagler, il diag Eng N 72:1193-8 D 17 '14 Tests check computed values of surges, E. Lauchli, diag Eng Rec 71:378-9 Mr 20 '15

### Valuation

Unique problem in valuation; inheritance tax appraisal of the Hales Bar hydro-electric plant. L: L. Tribus. Eng N 73:384-5 F 25

#### Alabama

Alabama power scheme, il plan map Engineer 119:132-5 F 5 '15 'Construction plant and methods for concrete work on the Lock twelve dam, Coosa river, Alabama. E. L. Sayers and A. C. Polk, diags plan Eng & Contr 43:260-5 Mr 24 '15

## British Columbia

Coquitlam-Buntzen hydroelectric development, il Elec W 66:175-7 Jl 24 '15

#### California

California

Hydroelectric development on Bishop Creek,
Cal. C. O. Poole, il diags plans Elec W 64:
757-61, 805-9, 858-63, 903-10, 949-53, 1001-3,
1045-7, 1093-4, 1143-7, 1193-6 O 17-D 19 '14
Interconnected systems serving San Francisco;
details of the generating equipments and
transmitting circuits tied in with the larger
system of the Pacific gas & electric company, which covers half of California. il
diags map Elec W 65:1356-82 My 29 '15
Lake Spaulding hydroelectric development of
the Pacific gas & electric co. R. L. Dougherty, il map Sibley J 30:42-8 N '15
Los Angeles nears realization of city power
plan. il Eng Rec 72:167 Ag 7 '15

Hydroelectric plants-California --- Continued

ydroelectric plants—California—Continuea Saving eight million tons of coal a year; a hydro-electric development of Big Creek, California, il Sci Am 112:382-3 Ap 24 '15 Spaulding-Drum power development; with discussion. J: A. Britton, il diags Am Soc M E J 37:215-22 Ap 15

Hydro-electric power plant in Chile. R. E. G. Clark, il diag Engineer 118:597-9 D 25 '14

#### Georgia

Building the Mathis dams. E. Lauchli. il diags plans Eng N 74:529-32, 589-91 S 16-23 '15 Construction elements of the Tallulah Falls development. C: G. Adsit and W. P. Ham-mond. il diags Am Inst E E Pro 34:2497-546 O

## Guatemala

Hydro-electric installation on a coffee plantation, J. H. Torrens, il Gen Elec R 18:219-22 Mr '15; Same cond. Eng M 49:266-7 My

Federal power house, Boise, Idaho. A. P. Connor. il plans Power 41:594-5 My 4 '15
Federal project at Minidoka. A. P. Connor. il plans map Power 41:422-5 Mr 30 '15
Government furnishes cheap electricity in southern Idaho. H. B. Walker. Power 41:

228-9 F 16 '15

#### Illinois

Report on water-power development of sanitary district of Chicago. Elec R & W Elec'n 65:1096-7 D 5 '14

Bombay hydro-electric scheme. il maps Engineer 119:378 Ap 16 '15
Bombay hydro-electric scheme. A. Dickinson. plans diags maps Inst E E J 53:693-714 My 15 '15; Abstract. Elec W 65:1302-3 My 22 '15; Discussion. Inst E E J 53:715-21, 802-4 My

British India, U S Sp Cons Rep 72:100-3 '15

Hydroelectric enterprises in Italy. L. W. Schmidt. Elec W 66:1131 N 20 '15

Hydroelectric power from snowclad Fujiyama. C. Tsukamoto. il diag map Elec W 66:310-13 O 23 '15

115,000-volt hydroelectric system in Japan. il diags plan Elec W 65:1599-1606, 1671-8 Je 19-26 15

### Maine

Central-station development at Portland, Maine. il map Elec W 65:519-22 F 27 '15 Hydroelectric development at Rumford, Maine. il Elec W 65:79-85 Ja 9 '15

### Massachusetts

Discussion of the hydro-electric power plant at the Wachusett dam, Clinton, Mass. Bos-ton Soc C E J 2:109-19 Mr '15 Hydraulic redevelopment at Turners Falls. H. M. Turner. il diags Eng N 74:202-6 Jl 29

Hydro-electric power plant at the Wachusett dam, Clinton, Mass, B. C. Thayer and E. R. B. Allardice. il diags Boston Soc C E J 1:523-48 D '14; Abstract. Munic J 38:101-3 Ja 28 '15 Massachusetts hydroelectric companies. map Elec R & W Elec'n 67:160 JJ 24 '15 New plant marks further step in development of Deerfield river, Massachusetts. il diags map Eng Rec 72:374-7, 423-4 S 25-O 2 '15

# Michigan

Hydro-electric development of the Peninsular power co. C: V. Seastone, il diags plans Am Inst Min E Bul 98:249-70 F '15

## Minnesota

Coon Rapids low head hydro-electric development on the Mississippi river near Minneapolis. J. W. Link. il diags plan W Soc E J 19:979-1006 D '14; Same cond. Eng & Contr 43:151-2 F 17 '15; Abstract. Am Soc M E J 37:193 Mr '15; Discussion. W Soc E J 19:1007-15 D '14

#### Montana

System of the Montana power company. M. Hebgen, il map Elec W 65:1535-44 Je 12 '15

# New England

Hydroelectric power in New England. H: I. Harriman. Elec R & W Elec'n 66:874 My 8

## New York (state)

New York (state)

Central hydroelectric plant of 50,000 horsepower replaces inefficient separate units at
Cohoes, A. G. Hillberg, il diags maps Eng
Rec 71:352-4, 395-8 Mr 20-27 '15

Cohoes, N. Y., hydro-electric development.
W. O. Rogers, il plans Power 42:466-71 O 5
'15

Hydroelectric development.

Hydroelectric development at Cohoes, N. Y. il diags plan Elec W 65:718-22 Mr 20 '15 Hydro-electric development of the Cohoes company at Cohoes, N. Y. B. R. Connell, il diags plans map Gen Elec R 18:340-52 My

Redevelopment of old canal power at Cohoes Falls, N. Y. il plan Eng N 73:456-9 Mr 4 '15 Salmon river power plant. W. O. Rogers. il plans Power 41:320-6 Mr 9 '15 Water-power plant in the heart of Rochester, N. Y. il Elec R & W Elec'n 66:1162 Je 19 '15

#### New Zealand

Hydro-electric developments in New Zealand.

Hydro-electric developments in New Zealand. il Engineer 119:447-8 My 7 '15 Hydro-electric power in New Zealand. W. Wilson, il map Eng M 49:336-51 Je '15 Interesting hydro-electric plant in New Zealand. il Engineer 120:254-5 S 10 '15

#### Oregon

5000-hp. chain drive for a hydro-electric plant. diags Eng N 74:544-5 S 16 '15

## Pacific coast

Electric developments on the Pacific coast. Il Elec W 65:1387-98 My 29 '15 Hydroelectric development in the West. Elec W 65:1514-15 Je 12 '15 Possibilities of hydro-electric power in the Pacific northwest. G: H. Moore. Eng N 73: 342-3 F 18 '15

342-3 F 18 '15 Practice in high-head hydraulic plants; abstract. J. P. Jollyman. Elec W 65:1513 Je 12 '15

## Panama

Electricity in the construction and operation of the Panama canal. E: Schildhauer. il Gen Elec R 18:sup688-721 Jl '15

# Pennsylvania

Ten per cent efficiency increase follows change from double to single-runner tur-bine, il diags Eng Rec 71:365-7 Mr 20 '15

# Quebec

Cedars hydro-electric development, St. Law-rence river, il diags plan Eng N 73:566-73 Mr 25 '15

Mr 23 19 Concrete-unit building construction at Cedars-Rapids. il diags Eng N 73:675-7 Ap 8 '15 Turbines of the Cedars hydro-electric plant, il diag Eng N 73:611-13 Ap 1 '15

#### Seattle, Washington

Mishap to Seattle municipal plant. il Elec W 65:902-3 Ap 10 '15

## South Carolina

Hydroelectric plant on the Savannah river. il diags Elec W 66:1132-4 N 20 '15

Hydro-electric undertakings in Spain, plan Engineer 120:41-2 Jl 9 '15

### Sweden

Features of Gullspang hydro-electric power station. Elec R & W Elec'n 67:412 S 4 '15 Swedish government builds hydroelectric plant above the Arctic circle. Il diags Eng Rec 72: 156-9, 194-8 Ag 7-14 '15

### Switzerland

Penstock carries 5,412-ft. head. diags Eng N 74:822 O 28 '15

## Hydroelectric plants -Continued

#### Tennessee

Business engineering problem in water power development with the solution for a specific case. W. V. N. Powelson. Eng & Contr 43: 222-6 Mr 10 '15; Excerpt (Change of runners permits 100 per cent head increase). Eng Rec 71:202 F 13 '15

### Texas

Austin's hydroelectric plant has unusual reinforced-concrete wheel casings. il diags Eng Rec 71:750-1 Je 12 '15
Hydroelectric development at Austin, Tex. il diags Elec W 65:1460-2 Je 5 '15
New Austin dam and power plant. F. S. Taylor. il Eng & Contr 43:465-7, 492-5, 535-6 My 26-Je 2, 16 '15; Same cond. Elec R & W Elec'n 66:939-45 My 22 '15
Power development at the Austin dam. F. S. Taylor. il diag plan Eng N 73:1124-6 Je 10 '15

#### United States

Electrical features of the U. S. reclamation service, F. H. Newell. Am Inst E E Pro 33: 1583-98 O '14; Summary. Elec W 64:753 O 17 '14; Discussion. Am Inst E E Pro 34:675-9 Ap '15

Features of engineering in the West. H. F. Stratton, il map (p 142) Sibley J 29:146-9 F

Merging hydro-electric interests, Power 41: 681-2 My 18 '15

#### Utah

Transmission at 130,000 volts in Utah, il plans Elec W 65:1451-5 Je 5 '15

#### Vermont

vermont
480-ft.-head Vermont water-power; features
of 6000-hp hydroelectric station at Chittenden, il diags Elec W 65:1297-9 My 22 '15
Hydro-electric power plants at Chittenden, Vt.
T: Fraher, il diags map Power 41:494-9
Ap 13 '15
New Chittenden plant of the Pittsford power
co, T: Fraher, il diags Eng N 74:14-17 Jl 1
'15

New power plant has highest head in New England, il map Eng Rec 71:652-3 My 22 '15

#### Wisconsin

Plant tests of a low-head hydro-electric development. F. Nagler, il diag Eng N 72:1193-8 D 17 '14

Hydroelectric plants, Municipal Boston municipal water plant derives income from water power. W. B. Conant. il Munic Eng 49:117 S '15

Hydroelectric power Conditions that will encourage hydroelectric development, J: A. Britton, Elec W 64: 1236-8 D 26'14

1236-8 D 26 '14
Development of water power on public lands.
Eng Rec 71:75-6 Ja 16 '15
Economic and social effects of hydro-electric
power, F. G. Baum, Power 42:597-8 O 26 '15
Electric power in Canadian industry. C. H.
Mitchell. map Power 42:667-8 N 9 '15
Electric power industry. D: B. Rushmore. il
map Gen Elec R 18:427-39 Je '15
Electro-metallurgical industries as possible
consumers of electric power. D. A. Lyon and
R. M. Keeney. Am Inst Min E Bul 104:170730 Ag '15; Excerpts. Iron Age 96:360-2 Ag 12

'15
Hydro-electric power compared with steam; with discussion, R. P. Bolton, Am Soc Heat & V E 20:374-91 '14
Hydro-electric power in Ontario, A. Beck, il Elec W 66:1072-3 N 13 '15
Hydro-electric project to be administration measure. Power 42:356-7 S 7 '15
New Niagara power project, il map Power 42: 416 S 21 '15
Proposed Missouri-Meramec river hydro-electric power development: committee report, Assn Eng Soc J 55:32-6 Jl '15
Relative costs of steam and hydro-electric

Relative costs of steam and hydro-electric power. Power 41:246 F 16 '15. Running railroads by water power. T: F. Logan, il Sci Am 112:603+ Je 19 '15

Senate committee told water-power bill would retard development. Elec W 65:54-7 Ja 2 '15 Testimony of Mr. Sidney Z. Mitchell on the water-power bill. Elec W 65:187-9 Ja 16 '15 Testimony on water-power bill. G. Pinchot; P. M. Lincoln. Elec W 65:131 Ja 9 '15 Unusual activity in Canadian power development. Eng N 74:456-7 S 2 '15 Uses for power from irrigation dams; abstract. E. K. Scott. Ind Eng 14:412-13 O '14

Hydrofluoric acid Industrial uses of hydrofluoric acid, K. F. Stahl. J Ind & Eng Chem 7:56-8 Ja '15; Same. Sci Am S 79:140-1 F 27 '15

Hydrogen

Same. Sci Am S 73:140-1 F 27 '15 '15'dydrogen
Determination of hydrogen in gas mixtures by means of colloidal palladium. G. A. Burrell and G. G. Oberfell. J Ind & Eng Chem 6:992-4 D '14
Dissociation of hydrogen into atoms. I. Langmuir. Am Chem Soc J 37:417-58 Mr '15
Dissociation of hydrogen into atoms. I. Langmuir and G. M. J. Mackay. Am Chem Soc J 36:1708-22 Ag '14
Electrolytic production of oxygen and hydrogen—a typical plant. il Elec R & W Elec'n 66:1170-1 Je 19 '15
Free energy of oxygen, hydrogen, and the oxides of hydrogen. G. N. Lewis and M. Randall. Am Chem Soc J 36:1969-93 O '14
Hydrogen and the rare gases. J. Dewar. Sci Am S 79:191 Mr 20 '15
Hydrogen, its technical production and uses. A. F. Seeker. Sci Am S 79:153 Mr 6 '15
Hydrogen manufacture; abstract. A. Fourniols. Met & Chem Eng 13:567 S 1 '15
New method of producing pure compressed hydrogen; abstract. F. Bergius. diag Am Soc M E J 37:482-3 Ag '15

Hydrogen chloride

ydrogen chloride
Studies in conductivity; the conductivity of
some formates and of hydrogen chloride in
(anhydrous) formic acid; cases of apparent
agreement of strong electrolytes with the
mass law. H. I. Schlesinger and A. W. Martin. Am Chem Soc J 36:1614-18 Ag '14

Hydrogen peroxide
Experimental data comparing the delicacy of
different tests for hydrogen peroxide in milk.
I. T. Darlington. J Ind & Eng Chem 7:676 Ag İ. 7

Hydrogen sulphide

ydrogen sulphide
Lead acetate test for hydrogen sulphide in
gas. R. S. McBride and J. D. Edwards. diags
pls U S Bur Stand Tech Pa 41:1-46 '14; Abstract. J Fr Inst 178:639-42 N '14; Abstract.
Met & Chem Eng 13:62 Ja '15
Method for the determination of hydrogen
sulphide in gas. A. B. Way. Am Gas Inst Pro
9:pt 1, 164-7 '14; Same cond. Am Gas Light
J 101:364 D 7 '14; Discussion. Am Gas Inst
Pro 9:pt 1, 167-78 '14

Hydrogenation

Hydrogenation of oils and soft fats. Sci Am S 80:99 Ag 14 '15 Studies in catalytic hydrogenation; a new 80:99 Ag 14 '15 tudies in catalytic hydrogenation; a new method of hydrogenation of volatile substances and the rate of hydrogenation of ethylene, J. B. Rather and E. E. Reid. Am Chem Soc J 37:2115-18 S '15

Hydrographic surveying

New hydrographic signal of the U. S. coast
and geodetic survey. diags Eng N 74:27-8 Jl

Submarine for hydrographic work, S. Lake, il diag Sci Am 113:272-3 S 25 '15

See also Sounding

Hydrolysis

ydrolysis
Estimation of raffinose by enzymotic hydrolysis. S. S. Hudson and T. S. Harding. Am Chem Soc J 37:2193-8 S '15
Hydrolysis of sodium carbonate in solution.
F. C. Frary and A. H. Nietz. Am Chem Soc J 37:2268-73 O '15
Hydrolysis of sugar solutions under pressure.
W. S. Hubbard and W. L. Mitchel. J Ind & Eng Chem 7:609-10 J '15
Manufacture of ethyl alcohol from wood waste; the hydrolysis of white spruce. F. W. Kressmann. J Ind & Eng Chem 7:920-2 N '15
lydrometallurgical apparatus. See Metallurgical

Hydrometallurgical apparatus. See Metallurgical

Hydrometallurgy Anaconda leaching and acid plants. E. P. Mathewson. il plans Eng & Min J 99:723-7

Mathewson, il plans Eng & Min J 99:723-7 Ap 24 '15 Case for copper hydrometallurgy; inexpensive and efficient treatment of smelter flue dust and carbonate ore. G: C. Westby. il Met & Chem Eng 13:295-7 My '15 Chloridizing blast roasting and leaching. G. A. Keep, il diag Eng & Min J 99:265-9, 315-22 F 6-13 '15

F 6-13 115 Chloridizing ores at Silver City, Utah. il diag Met & Chem Eng 12:757-9 D '14 Copper hydrometallurgy; process patented by E. A. C. Smith. Met & Chem Eng 13:451 Jl '15

Copper leaching; discussion. L. D. Ricketts and others. Met & Chem Eng 13:319-24 My

and others. Met & Chem Eng 13:319-24 My '15
Hydro-electrolytic treatment of copper ores. R. R. Goodrich, il Am Inst Min E Bul 104: 1551-94 Ag '15; Summary. Met & Chem Eng 13:766 O 15 '15
Hydrometallurgical treatment of Michigan copper tailings. R. D. Leisk, plan Met & Chem Eng 13:233-4 Ap '15
Leaching a zinc-lime ore with acids. O. C. Ralston and A. E. Gartside. Met & Chem Eng 13:151-5 Mr '15
Leaching at the Calumet & Hecla. Eng & Min J 99:821 My 8 '15
Leaching copper with ammoniacal solutions. Met & Chem Eng 13:449-51 Jl '15
Leaching experiments on the Ajo ores. S. Croasdale. Am Inst Min E Bul 92:1881-1929 Ag '14; Abstract. Met & Chem Eng 12:591-3
S '14; Excerpts. Eng & Min J 98:1098-9, 1139-40; 99:575-6 D 19-26 '14, Mr 27 '15
Metallurgy of copper in 1914. L. Addicks. Eng & Min J 99:91-2 Ja 9 '15
New copper metallurgy. H. A. Megraw. il diags Eng M 48:679-88 F '15
Precipitating plant at the Copper Queen mines. C. M. Coats and G. L. Allen, il diags plan

New copper metallurgy. H. A. Megraw. il diags Eng M 48:679-88 F '15
Precipitating plant at the Copper Queen mines. C: M. Coats and G. L. Allen. il diag plan Eng & Min J 99:17-19 Ja 2 '15
Problems in copper leaching; discussion. Am Inst Min E Bul 100:711-37 Ap '15; Discussion. 108:2459-60 D '15
Pulp constants, with tables to facilitate tonnage calculations for pulps of all usual solution and dry slimes specific gravities. G. H. Clevenger, H. W. Young and T. N. Turner. Eng & Min J 98:1079-94 D 19 '14
Roasting and leaching concentrator slimes tailings. L. Addicks. il flow sheet Am Inst Min E Bul 104:1471-84 Ag '15; Same. Met & Chem Eng 13:531-5 S 1 '15; Discussion. Am Inst Min E Bul 108:2460-4 D '15
Solution control in ferric-chloride leaching of sulphide copper ores. F. N. Flynn and R. H. Hatchett. Met & Chem Eng 13:291 My '15
Solution of pulp problems by graphic methods. W. J. McCauley. Eng & Min J 100:98-100 Jl 17 '15
Status of copper hydrometallurgy. Eng & Min J 99:31-9 '15

Status of copper hydrometallurgy. Eng & Min J 99:31-2 Ja 2'15 Van Arsdale's method of copper-ore treat-ment. Eng & Min J 100:61-2 Ji 10'15

Hydrometers

Measurements for the household, il U S Bur Stand Circ 55:122-5 '15 Will Quizz, jr. Power 41:453-4 Mr 30 '15

Hydroplanes Effect of beam on the speed of hydroplanes. L. Hope. Engineer 119:336-7 Ap 2 '15 Latest novelty in speed boats. il Sci Am 113:

156 Ag 21 '15

Hydrostatics

lydrostatics
Curves for solving the hydrostatic catenary.
H. M. Gibb. Eng N 73:668-70 Ap 8 '15
Hydrostatic catenary flume on a concrete
aqueduct. H. B. Muckleston. il diags map
Eng N 74:58-63 Jl 8 '15
Reinforced-concrete tank of 100,000-gallon capacity designed by use of diagrams. A. R.
James. diags Eng Rec 72:135-6 Jl 31 '15

also Compressibility; Hydrometers; Specific gravity

Hydroxyazo compounds
Constitution of the hydroxyazo compounds;
the action of unsymmetrical benzoylparatolylhydrazine upon benzoquinone and its
homologs. W: McPherson and G: W. Stratton. Am Chem Soc J 37:906-15 Ap '15

Hydroxylamine
Heat of neutralization of hydroxylamine and
tetramethylammonium hydroxide. E. O.
Ellingson. Am Chem Soc J 37:699-709 Ap '15
Three isomeric ethyl secondarybutyl hydroxylamines. L. W: Jones and L. Neuffer. Am
Chem Soc J 36:2202-8 O '14

Hydroxytriphenylcarbinol

triphenylcarbinol and attempts to isolate the corresponding triarylmethyl. M. Gomberg and R. L. Jickling. Am Chem Soc J 37:2575-91 N '15

Hydroxyurethanes

New hydroxyurethanes and chromoisomeric silver salts of their acyl derivatives. L. W: Jones and R. Oesper. Am Chem Soc J 36: 2208-23 O '14

Hygiene, Industrial

See also Factory restaurants; Factory sanitation; Foundry sanitation; Physical ex-Factory aminations

Hygiene, Military. See Military hygiene

Hygrograph Hygrograph, H: Briggs, Colliery 35:374-5 F

Hygrometers. See Psychrometers

Hygroscope
Measurements for the household, il U S Bur
Stand Circ 55:111-14 '15

Hyphen. See Compound words

Hypochlorites

Automatic device controls hypochlorite application. E. E. Ludwick. diags Eng Rec 72: 103-4 Jl 24 '15
Collapsible hypo plant packed in a trunk. il diag Eng Rec 71:373 Mr 20 '15
Disinfecting large public water supplies. T. Horton. Metal Work 84:40-1 Jl 9 '15
Hypochlorite treatment at Ludington. G: W. Clark. plan Munic J 38:394 Mr 25 '15
Kinks in the control of hypochlorite at Denver. W. W. De Berard. il Am Water Works Assn J 2:442-5 Je '15; Same. Eng Rec 71:393-4 Mr 27 '15
"New" surgical antiseptic; hypochlorites. Sci Am 113:164 Ag 21 '15
Relative efficiency of liquid chlorine and hypochlorite of lime. F. E. Hale. Eng & Contrustions in practice disclosed by water sterilization statistics; status of hypochlorite and liquid chlorine methods of treatment. F. E. Dishuters and liquid. Mr 6 '15

Hypophysis. See Pituitary gland

Hysteresis

Determination of hysteresis loops. A. Ytterberg, diag Elec W 65:212-13 Ja 23 '15
Effect of displaced magnetic pulsations on the hysteresis loss of sheet steel. L. W. Chubb and T: Spooner. il diags Am Inst E E Pro 34:2321-42 O '15

orn factor and its significance, F: Bedell, R. Bown and H. A. Pidgeon, Am Inst E E Pro 34:1051-8 Je '15; Abstract, Elec W 66:7 Jl 3 '15

John Hysteresis tests for rubber. E. L. Davies. J Ind & Eng Chem 6:985-6 D '14 Plotting hysteresis curves. A. Ytterberg. diag Elec W 66:1043 N 6 '15

Recent experiments on elastic hysteresis: abstract, R. Grammel, Am Soc M E J 37;115-16

Structure and hysteresis loss in medium-carbon steel, F. C. Langenberg and R. G. Webber, il Am Inst Min E Bul 98:291-300 F '15; Same, Iron Age 95:506-8 Mr 4 '15; Same cond. Iron Tr R 57:576-7 S 23 '15

Unsymmetrical hysteresis loop. J: D. Ball. Am Inst E E Pro 34:2275-97 O '15

See also Permeameter

Aneroid calorimeter and specific heat of ice. Iron Tr R 57:223 Jl 29 '15

Ice -Continued

Specific heat and heat of fusion of ice. H. C. Specific heat and N. S. Osborne, diags U S Bur Stand Bul 12:49-81 O 28 '15; Abstracts, J Fr Inst 179:489-91 Ap '15; Power 41:565 Ap 27 '15; Am Soc M E J 37:294-5 My '15

#### Manufacture

Artificial ice plants operating in conjunction with small central stations. H. Hecheimer. Elec R & W Elec'n 65:1168-9 D 19 '14' Ice making. Elec R & W Elec'n 67:57-8 Jl 10

Ice-making as a by-product of central sta-tions, H. Cochran, il diags Am Soc M E J 37:369-74 Jl '15

37:369-74 Jl '15
Initial and operating costs of large ice plants.
R. P. Kehoe. Power 42:545-6 O 19 '15
Making ice with purchased electric power.
C: A. Tripp. il Munic Eng 48:294-6 My '15
Motor drive adopted for compressors and other equipment in Reading (Pa.) ice plant. A. L.
Hart. il Elec W 66:1147-8 N 20 '15
Performance of refrigeration plant at Lübeck,
Germany. R: Stetefeld, Power 41:212-14 F 9

Year's records from a raw-water ice plant. Elec W 66:470 Ag 28'15

See also Refrigeration and refrigerating machinery

ice breaking vessels

Ice-breaking train ferry steamer, il diag plan (supp) Engineer 120:49-50 Jl 16 '15; Abstract. Int Marine Eng 20:515 N '15

ice cream Determination of fat in ice cream by the Bab-cock method, C. A. A. Utt. J Ind & Eng Chem 7:773 S '15

## Manufacture

Electricity in ice-cream manufacture. il Elec R & W Elec'n 66:413-15; 67:55-7 Mr 6, Jl 10

Ice harvesting
Harvesting ice, W: H. Malia, il Sci Am S 80:
132-3 Ag 28 '15
132-3 Ag 28 '15 CONV. il Eng N 73:939 My 13 Motor-driven ice saw. il Eng N 73:939 My 13

Ice houses

Data on wood frame and reinforced concrete ice storage houses. Eng & Contr 44:37-9 Jl 14 '15

14 '15
Design of railroad ice storage houses. Eng & Contr 42:563-5 D 16 '14; Abstract. Ry Age 57:759-60 O 23 '14
Fireproof ice-house at Lake Hopatcong. diags Eng Rec 71:50-1 Ja 9 '15
40,000-ton railroad icehouse electrically operated, plans Eng Rec 72:132 Jl 31 '15

we making See Lee-Manufacture

Ice making. See Ice-Manufacture

Ice on rivers, lakes, etc.
Ice fighting is systema droelectric plant. F. A. Allner, il diag map Eng Rec 72:66-8 Jl 17 '15

Severe frazil ice attack at Holtwood plant does not disturb service. F. A. Allner. il diag Eng Rec 72:113-15 Jl 24 '15

ice storage. See Ice houses

Icebergs and their detection. Sci Am S 80:110-11 Ag 14 '15

Iceland

### Industries and resources

Development of Iceland's resources, F. B. Arugrimsson, Sci Am 113:291 O 2 '15

1daho

See also Mines and mineral resources-Idaho

Idaho power and light company
Granted a certificate of convenience and necessity. Elec R & W Elec'n 66:249-50 F 6 '15

Practical life ideals, V. Karapetoff, Sibley J 29:191-4 Mr '15

Identification Passing of the Bertillon system of identifica-tion. R. B. Fosdick. Sci Am S 80:330-1 N 20

Igneous rocks. See Rocks, Igneous

Ignition of gas. See Gas-Ignition Illinois

See also Roads Illinois

Highway department

Highway work in Illinois, il Good Roads n s 8:205-10 D 5 '14

Industries and resources

Illinois oil in 1914. R. S. Blatchley. Eng & Min J 99:136-7 Ja 16 '15

Public utilities commission

Work of the Illinois utilities commission; with discussion. R. M. Feustel. W Soc E J 19: discussion. F

Illinois Central railroad

Grade reduction on the Kentucky division. F. G. Water, jr. il Ry R 57:389-93 S 25 '15 Sixty-fifth annual report, map Ry Age 59: 721-2, 784-6 O 22 '15 Track depression at Mattoon, il diag plan Eng N 74:110-12 Jl 15 '15

Illinois electric railways association
Economics in power consumption, feeder-tap
protection and care of commutators, and
one-man cars discussed. Elec Ry J 45:626-8
Mr 27 '15.

Meeting, Chicago, Oct. 29. Elec Ry J 46:952-3 N 6 '15

Presentation and discussion of committee reports. Elec Ry J 45:173 Ja 23 '15

Illinois mining institute
2d annual session. Colliery 35:325-6 Ja '15

Illinois press association
Golden jubilee. J. T. Elliott. Inland Ptr 55:382-4 Je 15

Illinois state association of master plumbers 23d annual convention, Springfield, Ill., Jan. 27-28, 1915. Metal Work 83:232-4 F 5 '15 23d annual convention, Springfield, Jan. 27-28. Dom Eng 70:179-82 F 6 '15

Illinois state association of sheet metal contractors

Convention, Peoria, Ill., May 12-13, Metal Work 83:740-3 My 21 '15

Illinois. University

linois. University
Acoustics of auditoriums; investigation of the acoustical properties of the armory at the University of Illinois. F. R. Watson. bibliog il Ill U Eng Exp Sta Bul 73:1-32 '14; Same. Sci Am S 78:358-9, 380-2 D 5-12 '14
Acoustics of auditoriums; investigation of the acoustical properties of the armory at the University of Illinois. F. R. Watson. il Brickb 24:257-8 O '15
End framing for armory at University of Illinois and some general features of this structure. Il diags Eng & Contr 43:141-3 F 17 '15
Engineering experiment station of the University of Illinois. E. B. Paine. Am Inst E E Pro 34:2421-7 O '15
Training in foundry work that is worth while.

Training in foundry work that is worth while. R. E. Kennedy and J. H. Hogue. il Foundry 43:405-11 O '15; Same. Iron Tr R 57:617-23 S 30 '15

Illium

Acid-resisting alloy to replace platinum in the construction of a bomb calorimeter. S. W. Parr. il Am Chem Soc J 37:2515-22 N '15 Developing an acid-resisting alloy. S. W. Parr. il Iron Tr R 57:991 + N 18 '15; Same. Metal Ind n s 13:457-8 N '15; Abstract. Am Soc M E J 37:656-7 N '15; Abstract. Met & Chem Eng 13:973 D 15 '15

Illuminating engineering society
8th annual convention, Cleveland, Ohio, Sept.
21-24, 1914. il Illum Engr 7:555-7 D '14

Financing engineering societies, C. H. Sharp; W. D. Weaver, Elec R & W Elec'n 66:918-20 My 15 '15

9th annual convention in the United States. L. Gaster, Illum Engr 8:443-4 N '15

9th annual convention; program. Elec W 66: 174 Jl 24 '15

9th annual convention, Washington, D. C. Elec W 66:679-80 S 25 '15

9th annual convention, Washington, D. C., Sept. 20-22. Elec R & W Elec'n 67:619-24 O 2 '15

Illuminating engineering society—Continued
9th annual meeting, Washington, D. C., Sept.
20. Elec R & W Elec'n 67:574-7 S 25 '15
Progress of the past year. Illum Engr 8:1-4
Ja '15

Review of the Washington convention, Sept. 20-23. J. R. Cravath. Elec W 66:738-9 O 2

Illumination. See Lighting

Illuminometer. See Photometry

Mnoff tanks
Additions to the Baltimore sewage-works, il diag Eng N 74:278-9 Ag 5 '15
Albany sewage-disposal works, J; H, Gregory, plans Eng N 74:692-5 O 7 '15
Constructing the Fitchburg sewage-works, F, A, Marston, il diags Eng N 74:4-6 Jl 1 Imhoff tanks Additions

'15
Design feature of new sewerage system and sewage disposal works for Cleburne, Texas. R. E. McDonnell. diags plans Eng & Contr 44:72-5 Jl 28 '15
Design of two residential sewage treatment plants, including settling tanks of Imhoff type. S: A. Greeley. il diags plans Eng & Contr 42:565-7 D 16 '14
Factors in design of Imhoff tanks at Fitchburg, Mass. il Eng Rec 71:332-3 Mr 13 '15
Imhoff sewage tank at Manchester, England. O. J. Wilkinson. diags Eng N 73:770-1 Ap 22 '15
Imhoff sewage tank, Waupun, Wisconsin. diag

Imhoff sewage tank, Waupun, Wisconsin. diag Eng N 73:280 F 11 '15
Imhoff tanks and sprinklers for sewage of Brighton district, Rochester, New York. diags plan Eng Rec 71:679-82 My 29 '15
Multiple flow chambers in Imhoff tanks. J; H. Gregory, diags Eng Rec 71:433-4 Ap 3 '15
Multiple flowing-through chambers in Imhoff tanks. diag Eng Rec 71:72-3 Ja 16 '15
Operating records of Atlanta sewage treatment plant show adequate degree of purification. C: C. Hommon. il Eng Rec 72:4-7 Jl 3 '15

Remodeling of septic tanks into Imboff tanks eliminates odors from land irrigation, il diags plan Eng Rec 71:747-8 Je 12 '15

**Imino**acetonitrile

ew synthesis of iminoacetonitrile and its conversion to hydrazinodiacetic acid, J. R. Bailey and D. F. Snyder. Am Chem Soc J 37:935-42 Ap '15

Immigrants

Measuring human intelligence; standardized tests used by the Public health service. H. A. Knox. il Sci Am 112:52-3+ Ja 9 '15 See also English language (for foreigners)

Immigration War and immigration; an unintentional exper iment in restriction. Sci Am 113:244 S 18 '1

Imposture

See also Forgery; Fraud

incandescent electric lamps. See Electric lamps,

Incandescent lighting. See Electric lighting, Incandescent; Gas lighting, Incandescent; Gas

Incinerators. See Refuse incinerators

Inclined elevators. See Elevators, Inclined

Income

Income tax

Extending the inquisition. J Account 19:50-2

Ja '15 Income tax amendment. J Account 19:292-4; 20:217-19 Ap. S 145

Income tax department. See monthly numbers of Journal of accountancy Return of annual net income by corporations. W. F. Weiss. J Account 19:260-7 Ap '15

Incubators, Bacteriological. See Bacteriological incubator

Index plate
Making an index plate, G. H. Gardner, Mach
21:659 Ap '15

Indexing

Card index and what it means. J. J. Reynolds. Elec Ry J 46:815-18 O 16 '15 Engineering libraries. L. B. Krause. Ry R 56: 356 Mr 13 '15

Filing and indexing of office computations. F. H. Jones. Eng Rec 72:128-9 Jl 31 '15 Growth of engineering libraries and need of indexes. Ry R 56:189-91 F 6 '15 Growth of engineering libraries and the need of indexes. H. W. Wilson. Ry R 56:430 Mr 27 '15

Indexing technical literature. W. G. Lohmeyer. il Mach 21:901-3 Jl '15

See also Files and filing (documents)

Compound indexing on the milling machine.

J: A. Hinckley. Mach 21:1005 Ag '15

Problem in slotting and indexing. D. A. Hamp-

Indexing fixtures
Turret indexing mechanisms. A. A. Dowd. il
diags Mach 21:797-801 Je '15

India Technical training in India. Engineer 120:429-

Bridges

Design and construction of the Lower Ganges bridge in India. il diags map Eng & Contr 42:478-81 N 18 '14 Hardinge bridge over the lower Ganges. F. C. Coleman. il diags Eng N 73:1160-4 Je 17 '15

Commerce

British India. H: D. Baker and others. U S Sp Cons Rep 72:1-572 '15 Hour of America's trade opportunity in India. T'Ishi Bhutia Kywagh Hla'. Am Ind 16:25-7

Marketing cotton goods in India. Textile World 48:374-6 Ja '15

Economic conditions

British India. H; D. Baker and others, il U S Sp Cons Rep 72:1-572 '15

Industries and resources

Ancient sedimentary iron ores of British India. C. M. Weld. maps Econ Geol 10:435-52 Jl '15

Railroads

See Railroads-India

Indian lands

United States mining statutes annotated, J. W. Thompson, U S Bur Mines Bul 94: pt 2, 952-1037 '15 Indiana

Indiana desert. H. Maxwell. il Sci Am S 80:  $248-50~{\rm O}~16$  '15

Indiana electric light association
7th annual convention, Terre Haute, September 8-10. Elec R & W Elec'n 67:534-6 S Septem-

th annual convention, Terre Haute, Sept. 8-10. Elec W 66:566-7, 626-7 S 11-18 '15

Indiana engineering society
Annual meeting, Indianapolis, Jan. 21, 23, 1915.
Eng N 73:182 Ja 28 '15

Indiana sanitary and water supply association 8th annual meeting, Indianapolis, Feb. 23-24, 1915. Eng N 73:455 Mr 4 '15

Indiana state association of master plumbers 19th annual convention, La Porte, March 8-10. Dom Eng 70:344-7 Mr 13 '15

Three day meeting opened at La Porte, Metal Work 83:440-2 Mr 19 '15

Indianapolis, Indiana

Floods

Flood-protection work on Fall creek at Indianapolis, Ind. L. F. Wertz. il diags map Eng N 72:1120-3 D 3 '14
High levees will protect Indianapolis from floods. il map Eng Rec 72:560-2 N 6 '15
Indianapolis flood protection. il map Eng N 74: 961-5 N 18 '15

Sewerage

Improvement of Pogue's Run. il plans Munic Eng 48:236-9 Ap '15 Indianapolis builds million dollar storm-water drain under railroad yards. il Eng Rec 71:560-1 My 1 '15

Water supply

Indianapolis pumping station designed for continuous service. Eng Rec 71:208 F 13 '15

#### Indians

### Languages

Visible speech; eye seeing and the rule measuring the difference between sounds. A. L. Kroeber, il diags Sci Am 112:471 My 22 '15

#### Indians of North America

### Social life and customs

Indian and nature; the basis of his tribal organization and rites. A. C. Fletcher. Sci Am S 89:314-15 N 13 '15

Indians of South America Roosevelt-Rondon scientific expedition. L. E. Miller, il Sci Am S 79:268-70 Ap 24 '15

Indicator diagrams

Comment on diagrams. E. H. Sawers; V: Bonn.
Power 40:815 D 8 '14
Indicator diagrams from blowing cylinder.
C: E. Sampson. diag Power 42:551 O 19 '15
Notes on indicator diagrams. A. R. Nottingham. Power 41:309-10 Mr 2 '15

Indicators

ndicators

Adjustable stop on O'Kill indicator, il diag Automobile 33:375 Ag 26 '15

Electric water level indicator with distant reading. G: Schmidt, diag plan Am Soc M E J 37:45-6 Ja '15

Indicator reducing motion. H. G. Boutell, il Ry Age (Mech ed) 89:563 N '15

Influence of indicator connecting pipes. T: W. Morley, diag Power 41:622-3 My 4 '15

Lamp slip indicator. F: Bedell. Elec R & W Elec'n 65:1224 D 26 '14

Multiple-unit boiler control. E. F. Fisher, diags Power 42:378-80 S 14 '15

Power-factor indicator, J: A. Randolph, diags Power 40:836-8 D 15 '14

Use of optical indicators for checking defects in functioning of motors, diags Automobile 33:976-9, 1018-19 N 25-D 2 '15

Indicators and test papers

33:976-9, 1018-19 N 25-D 2 '15
Indicators and test papers
Indicator in pyroligneous acid. J. M. Johlin. J
Ind & Eng Chem 7:596 Jl '15
Natural indicators. H. W. Brubaker. Am Chem
Soc J 36:1925-8 S '14
Radiometric measurements of the ionization
constants of indicators. E. J. Shaeffer, M. G.
Paulus, and H. C. Jones, diags Am Chem
Soc J 37:776-897 Ap '15
Radiometric measurements of the ionization
constants of indicators. M. G. Paulus, J. F.
Hutchinson and H. C. Jones. Am Chem Soc
J 37:1694-1704 Jl '15

Indigo Cultivating Chinese indigo. G: E. Anderson, Textile World 49:381 Je '15 Indigotin content of some Japanese indigoes. S. Sato. J Ind & Eng Chem 7:675-6 Ag '15

Indigo, Artificial

Artificial indigo made in the United States. Met & Chem Eng 13:773-4 N 1 '15 Development of artificial indigo. Textile World 48:511 F '15

#### Indo-China

#### Commerce

China and Indo-China markets for American lumber. F. H. Smith. U S Bur For & Dom Com 104:1-39 '15

Inductance

Effective resistance and inductance of iron and bimetallic wires. J: M. Miller. diags U S Bur Stand Bul 12:207-67 N 8 '15

Induction coils arge induction coil of novel design, il Sci Am 113:250+ S 18'15

Spark-plug ignition systems. A. H. Israel. diags Power 41:258-60 F 23 '15

See also Electric transformers; Electromagnets

Inductive interference. See Electric lines-Inductive interference

Industrial accidents. See Accidents, Industrial Industrial arbitration. See Arbitration, Indus-

#### Industrial arts

See also Architecture; Bookbinding; Brewing; Building; Business; Canning and preserving; Chemical engineering; Chemistry, Tech-

nical; Commerce; Dyes and dyeing; Electric engineering; Engineering; Engraving; Fac-tories; Foundry practice; Inventions; Ma-chine shop practice; Machinery; Metallurgy; Painting, Industrial; Patents; Photography; Plumbing; Pottery; Printing; Tanning

Painting, Industrial; Patents; Photography; Plumbing; Pottery; Printing; Tanning
Industrial betterment
Co-operative spirit and industrial peace. F. B.
Gilbreth and L. M. Gilbreth. Iron Age 96:
528-30 S 2 '15
Enlarging the worth of the worker and the perspective of the employer. J. P. Channing.
il Am Inst Min E Bul 99:529-38 Mr '15; Except (Student engineers teach workmen).
Iron Age 95:554-5 Mr 11 '15; Discussion. Am Inst Min E Bul 101:1095-9 My '15
How to keep men in your employ, W. A.
Grieves. Iron Tr R 57:488-9+ S 9 '15
Human factor in production. A. A. Dowd. Iron
Tr R 55:1186+ D 24 '14
Labor problems in scientific management.
Iron Age 94:1369-72 D 10 '14
More about the human factor. D: M. Myers.
Eng M 49:801-8 S '15
New certificate of character for manufacturers. R. G. Valentine. Ind Eng 15:40-3 F '15
Teaching human engineering. F. H. Rindge, jr. Eng N 73:577-8 Mr 25 '15
See also Employees; Factory sanitation; Garden cities; Housing problem; Industrial education; Profit sharing; Safety devices and measures; Scientific management; Welfare work in industry

Industrial buildings

Pa. il Iron Tr R 57:484 S 9 '15
Hallenbeck-Hungerford buildings, North East, & Bldg 47:69-72 F '15
Some industrial buildings. G: C. Nimmons. il plans Arch Rec 38:228-45 Ag '15

See also Department stores; Factories; Foundries

Industrial counselor and the industrial audit. R. G. Valentine, Iron Age 94:1369-70 D 10 '14

Industrial education

Boston symposium on employment and education. Am Soc M E J 37:277-81 My '15
Educational scrap heap and the blind alley job. L. W. Dooley. Sci Am S 79:170-1 Mr 13 '15; Excerpts. il Sci Am 112:247 Mr 13 '15
Industrial education again, E. H. Fish. Power 41:207-8 F 9 '15
Master mechanics to teach in public schools. W: Wirt. Metal Work 83:841 Je 11 '15
Practicing engineers and industrial education, F; G. Bonser, Eng N 72:1133-4 D 3 '14
Trade school idea at Gary, Ind. il Bldg Age 37:25-8 S '15
Trade training and world commerce, H. E.

Trade training and world commerce. H. E. Miles. Am Ind 15:19-20 F '15
Training for the industrial side of engineering. A. P. M. Fleming. Inst E E J 53:566-73; Discussion. 53:574-86 Ap 15 '15

Training of shop teachers for industrial schools. H. E. Speece. Mach 22:47-8 S '15

See also Apprentices; Corporation schools; Engineering education; Schools and shops, Cooperation of; Technical education; Trade schools; Vocational education; also Berea college: Hampton institute schools; Vocational educa college; Hampton institute

#### Exhibitions

Industrial education exhibition, il Am Ind 15: 42-4 Je '15

Industrial electric heating association Industrial electric heating association formed at Toledo on May 1. Elec R & W Elec'n 66:855 My 8 '15

Industrial fellowships
Unique system of service to industry; Mellon institute of industrial research. J. J. O'Connor. il Am Ind 16:27-8 O '15

Industrial locomotives. See Locomotives, Indus-

Industrial plants
Heating and ventilating industrial plants.
E. L. Hogan, Metal Work 83:263-5 F 12 '15;
Same. Dom Eng 70:239-41 F 20 '15

See also Electric plants; Factories; Foundries; Iron works; Machine shops; Metallurgical plants; Steel works

Industrial railroads. See Railroads, Industrial Industrial relations, Commission on. See United States—Commission on industrial relations

Industrial relations committee
Railroad brotherhoods busy. W. L. Stoddard.
Ry Age 59:1016 N 26 '15

Ry Age 59:1016 N 26 '15

Industrial research
Administration of industrial research laboratories. Met & Chem Eng 13:922 D 1 '15
Co-operation between university and industry.
Met & Chem Eng 13:885-7 D 1 '15
Description of the research laboratory of the General electric company. L. A. Hawkins. il Gen Elec R 18:416-27 Je '15
Doing without Europe. Sci Am 112:176, 196, 223 F 20-Mr 6 '15
Education for research. W: H. Walker. J Ind & Eng Chem 7:2-4 Ja '15
Engineering experiment station of the University of Illinois. E. B. Paine. Am Inst E E Pro 34:2421-7 O '15
England's tardy recognition of applied science.
W. R. Whitney. J Ind & Eng Chem 7:819-22
O '15
National council of science. Engineer 120:109 J1 National council of science. Engineer 120:109 Jl

30 '15 Object and work of the Mellon institute. R. F. Bacon. J Ind & Eng Chem 7:343-7 Ap '15 Relation of research to the progress of manufacturing industries. W. R. Whitney. Gen Elec R 18:868-72 S '15; Same. Eng & Contr 43:537-9 Je 16 '15 Research. W. R. Whitney. Gen Elec R 18:1012-14 N '15

Research and industry. Sci Am 112:616+ Je 19

Research and progress in American manufacture. R. F. Bacon. Sci Am S 80:334-6 N 20 '15 Research in chemical industry. C. F. Burgess. Met & Chem Eng 13:921 D 1 '15 Research work at the National cash register company. H. G. Dorsey. il Sibley J 29:115-21 To '15

Ja '15
Research work at the University of Pittsburgh, S: R. Scholes. Foundry 43:237 Je '15
200-mile artificial transmission line, C. E:
Magnusson, J. Gooderham and R. Rader, il
diags Elec W 65:1545-9 Je 12 '15
War, industrial research, and the American
manufacturer. Sci Am 111:518 D 26 '14

See also Chemical research; Chemistry,
Technical; Laboratories; Scientific research

Industrial service movement

Constrial service movement Enlarging the worth of the worker and the perspective of the employer. J. P. Channing. il Am Inst Min E Bul 99:529-38 Mr '15; Excerpt (Student engineers teach workmen). Iron Age 95:554-5 Mr 11 '15; Discussion. Am Inst Min E Bul 101:1095-9 My '15 Teaching human engineering. F. H. Rindge, jr. Eng N 73:577-8 Mr 25 '15

Industrial towns. See Model towns

How to create industrial leaders; chapter from "Industrial leadership." H: L. Gantt. Eng M 50:428-37 D '15

Individual and corporate development of industry. C: P. Steinmetz. Gen Elec R 18:813-16 Ag '15

Industrial energy as a military weapon. J. R. Finlay. Met & Chem Eng 13:547-50 S 1 '15; Abstract. Eng M 50:95-7 O '15

Industrial leadership. H. L. Gantt. Iron 95:196-7 Ja 21 '15; Same cond. Metal 84:472 O 8 '15 Iron Age

See also Efficiency, Industrial; Government regulation of industry; Labor and laboring classes; Manufactures; also subdivision In-dustries and resources under names of countries

Infection

Prevention of infection. T: Darlington. Iron Tr R 56:770 Ap 15 '15

Infectious diseases

See Typhoid fever; Typhus fever; Yellow fever

Inflammable liquids Storage and handling of gasoline. Sci Am 112: 356 Ap 17 '15

See also Gasoline; Petroleum

Inflammable mixtures

nflammable mixtures
Decomposition of ammonia and the chances
of explosions. F. L. Fairbanks. Power 42:
715-17 N 23 '15
Inflammability of mixtures of gasoline vapor
and air. G. A. Burrell and H. T. Boyd. diags
U S Bur Mines Tech Pa 115:1-16 '15; Same
cond. J Ind & Eng Chem 7:414-17 My '15;
Summary. Met & Chem Eng 13:802 N 1 '15
Influence of temperature and pressure on the
explosibility of methane-air mixtures. G. A.
Burrell and I. W. Robertson, diag J Ind &
Eng Chem 7:417-19 My '15

Infra-red rays

Air transparency for infra-red rays; applica-tion of these rays to telephotography. G. Michaud and J. F. Tristan, il Sci Am 111: 521 D 26 '14

Controlling infra-red emission. W. W. Coblentz. Elec W 66:1155-6 N 20 '15 Glasses for protecting the eyes from infra-red rays. W. W. Coblentz. J Fr Inst 179:579-80 rays. v

Inglewood, California

## Politics and government

Experience at Inglewood, with the city manager form of government. P. E. Kressley. Eng & Contr 42:465-6 N 11 '14

Initial letters

Proper use of initials, J. L. Frazier, Inland Ptr 55:499-502 Jl '15

Injectors

Boiler-compound injector made up of pipe fit-tings. T. W. Reynolds. plan Elec W 66:813 O

Exhaust injectors. R. W. Rogers. diag Ry Age (Mech ed) 89:514 O '15
 Injuries. See Accidents, Industrial; First aid in illness and injury; Personal injuries; Workmen's compensation

Ink
Composition, properties, and testing of printing inks. bibliog U S Bur Stand Circ 53:135'15
Difference media: papers and inks. Illum Eng

11g mas. 35 '15 media; papers and inks. Illum Eng Soc 10:379-87 no 5 '15 Printing inks. J Fr Inst 179:215-16 F '15 Structure of a simple red ink. Inland Ptr 56: 117 O '15

Inosite

Inosite and pinite and some of their deriva-tives. E: G. Griffin and J. M. Nelson, Am Chem Soc J 37:1552-71 Je '15

Insanity

Mental tests of dementia. B. Hart and C. Spearman. Sci Am S 80:206-8 S 25 '15 Psychanalytic movement: its services in the prevention of insanity. J. J. Putnam. Sci Am S 78:391, 402 D 19-26 '14

Inscriptions

How we got our alphabet; the alphabetic dis-coveries. W. Rice. Inland Ptr 55:531-2 Jl '15

Inscriptions, Cuneiform
Curiosities of bygone ages: relics from New
Mexico and from Bible lands, il Sci Am 112:
87+ Ja 23 '15 See also Cuneiform writing

Insecticides

Arsenates of lead. H. V. Tartar and R. H. Robinson. Am Chem Soc J 36:1843-53 S '14 Valuation of commercial arsenate of lead. R. H. Robinson and H. V. Tartar. J Ind & Eng Chem 7:499-502 Je '15

Insectivorous plants
Are plants cruel? S. L. Bastin, il Sci Am 112:
632-3 Je 26 '15

Insects

Ears and sound-producing mechanisms of in-sects. H. Bastin, il Sci Am 111:527 D 26 '14 Insects' nests, il Sci Am S 80:212-13 O 2 '15 Sense of smell in insects. Sci Am S 79:80 Ja

Verdict of the insects as to time of death. D. Waterson. Sci Am 113:11 Jl 3 '15

See also Borers (animals); Flies; Lac insect; Mosquitoes

Insects, Injurious and beneficial
Bird enemies of forest insects. W. L. McAtee.
il Am For 21:681-91 Je '15

Brookline protects birds, C: B. Floyd, il Am For 21:792-6 Jl '15 Protection against insect pests. Sci Am S 80: 130 Ag '28 '15

nspection an we improve the inspection system? D. R. Stevens. il Horseless Age 36:65-8, 101-4 Jl 21-28

28 '15

How the product of the foundry is inspected.
E: Godfrey. Foundry 43.222-4 Je '15; Same cond. Iron Age 95:898-9 Ap 22 '15
Inspecting goods after they are received; the buyer's rights and liabilities. E. J. Buckley.
Elec R & W Elec'n 67:416 S 4 '15; Same

buyer's rights and liabilities. E. J. Buckley. Elec R & W Elec'n 67:416 S 4 '15; Same (Right of buyer to reject goods) Metal Work 81:355 S 10 '15
Inspection system for machine shops. W: B. Wessels. Mach 21:451-3 F '15
Operating a foundry on a scientific basis. F; A. Parkhurst, il Foundry 43:107-10 Mr '15
Relation of the inspection department to the management. F. B. Corey. Ind Eng 15:17-18
Ja '15; Same. Iron Age 95:566-7 Mr 11 '15

See also Boiler inspection; Bridge inspection; Car inspection; Electric inspection; Fire inspection; Locomotives—Inspection; Mine inspection; Waterworks—Inspection

nstitute of heating and ventilating engineers Summer meeting, Leamington, June 22. Heat & Ven 12:47-8 Ag '15

Institute of metals
Annual general meeting, London, March 1819. Engineer 119:309-10 Mr 26 '15
Annual meeting, London, March 18-19. Foundry 43:193-4 My '15
Autumn meeting, Sept. 17. Engineer 120:298-9
S 24 '15

Institute of metals, American. See American institute of metals

Institute of paving brick manufacturers Brickmakers organize to improve their art. Munic Eng 49:119-20 S '15 Organization. Good Roads n s 10:159 S 4 '15

Institution of civil engineers
Presidental address. A. Ross. Engineer 120:
 430-1 N 5 '15

Institution of electrical engineers
Inaugural address of president. J: Snell. Inst
E E J 53:1-13 D 1 '14
Report of the council for presentation at the
annual general meeting of 27 May, 1915. Inst
E E J 53:722-35 My 15 '15

Institution of mechanical engineers Annual general meeting. Engineer 119:197-8 F 26 '15

Manchester meeting, 1915. Engineer 120:417 O

Institution of mining engineers General meeting in London, June 10. Engineer 119:610-11 Je 18 '15

Institution of water engineers
Winter meeting. Engineer 118:588 D 18 '14
Instruments. See Astronomical instrument Instruments. See Astronomical instruments; Drawing instruments; Electric instruments; Measuring instruments; Surgical instruments; Surveying instruments

Insulating tape
Comments on insulating tape. G: E. Austin.
Elec Ry J 45:888 My 8 '15

Insulation

pparatus for testing approximate breaking strength of pin insulators, diag Elec  $\overline{
m W}$  64: Apparatus for

Apparatus for testing approximate blocking strength of pin insulators diag Elec W 64: 1114 D 5 '14
Automatic section insulators for mine trolley wires, plan Elec W 65:1207 My 8 '15; Elec Ry J 45:852 My 1 '15
Combination cable insulator and splicing sleeve, il Elec Ry J 46:114-15 Jl 17 '15
Comparative insulation requirements in the United States and European countries. Elec R & W Elec'n 65:1133 D 12 '14
Dielectric properties of different insulating materials; abstract K W. Wagner. diags Elec W 65:1044-5 Ap 24 '15
Discussion on transmission lines. (See Proceedings for June and July, 1915) Am Inst E E Pro 34:3117-26 D '15
Distributing potential over a string of insulators. J. L. Brenneman and H. M. Crothers. diag Elec W 64:1095-9 D 5 '14

Economy in the operation of 55,000-volt insulators. M. T. Crawford. il Am Inst E E Pro 33:1159-64 Ag '14; Discussion. 34:155-60 Ja

Effect of altitude on the spark-over voltages of bushings, leads and insulators. F. W. Peek, jr. il diags Am Inst E E Pro 33:1877. 86 D '14; Same. Gen Elec R 18:137-42 F '15; Discussion. Am Inst E E Pro 34:1328-49 Je

ffect of insulating resistance on armored cables; abstract. A. Gavand. Elec W 65:1684 Je 26 '15 ffect of transient voltages on dielectrics. F. W. Peek, jr. il Am Inst E E Pro 34:1695-1747 Ac '15. Effect

F. W. Feek, Jr. 1747 Ag '15
Electric perforation strength of liquids, semi-liquids and solid insulation as affected by pressure; abstract. F. Kock. Elec W 65:919
Ap 10 '15

Ap 10 15
Electrical characteristics of solid insulations.
F. W. Peek, jr. Gen Elec R 18:1050-7 N '15
Electrical porcelain. I. Testing with a highfrequency oscillator. II. The problematical
points of manufacture. III. Experiences and

points of manufacture. III. Experiences and experimental investigations. E. E. F. Creighton. iI Am Inst E E Pro 34:753-841 My '15; Abstract and discussion. Elec R & W Elec'n 66:395-6 F 27 '15; Elec W 65:528 F 27 '15; Discussion. Am Inst E E Pro 34: 2622-45 N '15

2622-45 N '15

Experimental data concerning the safe operating temperature for mica armature-coil insulation. F. D. Newbury. diags Am Inst E E Pro 34:2555-72 O '15; Abstract. Elec W 66: 1205-6 N 27 '15

Four years' operating experience on a hightension transmission line. A. Bang. diags pls Am Inst E E Pro 34:1425-45 Jl '15; Abstract. Elec W 66:10-11 Jl 3 '15

High frequency; breakdown values of oiled pressboard. F. W. Peek, jr. Gen Elec R 18: 934 S '15

High frequency oscillator for porcelain-insu-

High-frequency oscillator for porcelain-insu-lator testing, il diag Elec R & W Elec'n 66: 880-1 My 8 '15; Elec W 65:1207 My 8 '15; Ry R 56:668 My 15 '15

High-tension power transmission problems discussed at December A. I. E. E. meeting. diags Elec Ry J 44:1348 D 19'14 High-voltage transmission at high altitude. P. H. Thomas. il diags plan Elec W 65:30-3

Ja 2 15

Hot and cold water test for insulators. Elec W 66:92 Jl 10 '15

Insulating properties of solid dielectrics. H. L. Curtis. diags U S Bur Stand Bul 11:359-420 My 10 '15; Excerpt (Volume resistivity table) Elec R & W Elec'n 66:171 Ja 23 '15

Insulation for railway motors. R. E. Hellmund. Elec Ry J 45:508 Mr 13 '15

Insulation testing. G. B. Shanklin. Gen Elec R 18:1008 O '15

Insulator depreciation and effect on operation.

Insulator depreciation and effect on operation.
A. O. Austin. il Am Inst E E Pro 33:1863-76 D'14; Discussion. 34:1328-49 Je'15
Insulator depreciation and spark-over voltages; abstracts and discussion of papers by F. W. Peek, jr. and A. O. Austin. Elec R & W Elec'n 65:1187-8 D 19'14; Elec W 64:1190-1 D 19'14
Insulator performance from operating viewpoint. E. P. Peck. il Elec W 66:1077-9 N 13'15

Investigation of dielectric losses with the cathode ray tube. J: P. Minton. il Am Inst E E Pro 34:1115-65 Je '15

Law of corona and spark-over in oil. F. W. Peek, jr. Gen Elec R 18:821-7 Ag '15

Leakage prevention by shielding, especially in potentiometer systems. W. P. White. diags Am Chem Soc J 36:2011-20 O '14

Leakage through insulation, and how it may show up in repair work, E. C. Parham. Elec W 66:979 O 30 '15

Maintaining high insulation resistance. H. M. McLellan. diag Power 41:365 Mr 16 '15

Maintenance of line insulation. Elec W 65: 586-7 Mr 6 '15

Overhead electrolysis and porcelain strain insulators. S. L. Foster. il Am Inst E E Pro 34:1549-58 Ag '15; Abstract. Elec Ry J 46: 582-3 S 18 '15

Insulation -Continued

Process of impregnating coils; and a large, modern impregnating plant. R. Reid. il Gen Elec R 18:48-51 Ja '15
Provisional specification for insulator testing covering inspection and tests of high-tension line insulators of porcelain, for over 25,000 volts. Am Inst E E Pro 34:1033-45 My

'15
Relation of insulator resistance to puncture Voltage, Elec W 66:304 Ag 7 '15
Rogers tree insulator, il Elec R & W Elec'n 67:907-8 N 13 '15
Slot insulation design, with comparison between the unit dielectric stresses in the slot insulation of a low-voltage alternator and those in a high-voltage machine. H. M. Hobart, Gen Elec R 18:366-71 My '15
Rogeification for insulator testing, discussion

Hooart. Gen Elec R 18:366-71 My '15
Specification for insulator testing; discussion.
Am Inst E E Pro 34:300-12 F '15
Temperature limits for mica insulation; discussion. Elec W 66:1130 N 20 '15
Temperature of mica insulation; discussion. Elec R & W Elec'n 67:942 N 20 '15
Test of a direct-current motor. H. C. Lightfoot. diags Elec R & W Elec'n 67:240-6 Ag 7 '15

T 15 Testing electrical porcelain; abstract. A. Chernyshoff and C. A. Butman. Elec W 65:1554-5 Je 12 '15

5 Je 12 '15 olume resistivity and surface resistivity of insulating materials. H. L. Curtis. diag Gen Elec R 18:996-1001 O '15 inc cables insulated with reclaimed rubber. Elec W 65:1614 Je 19 '15

See also Electric cables; Electric resistance; Electric wire and wiring

Insulation (heat)
Conduits and insulation for heating pipes.
C: L. Hubbard, diags Dom Eng 72:252-3 Ag
28 '15

Diatom heat-insulating brick. Met & Chem Eng 13:129 F '15
 Insulate huge concrete building for cold storage in Chicago. Eng Rec 72:662-3 N 27 '15
 Maintenance of insulation for low temperatures. R. L. Shipman. Power 42:118-19 Jl 27 '15

New heat-insulating material. Eng N 73:878-9 My 6 '15

Preparation and properties of fibrox; abstracts. E. W. Weintraub. Met & Chem Eng 13:315 My '15; Eng M 49:415 Je '15

Producing magnesia pipe and boiler covering. F. W. Bartlett. Power 42:426-7 S 21 '15

Thermal insulation of high-temperature equipment. P. A. Boeck, diags Am Inst Min E Bul 104:1539-50 Ag '15; Excerpts, Iron Age 96: 353-4 Ag 12 '15; Sci Am S 80:315 N 13 '15; Discussion, Am Inst Min E Bul 108:2513-19

Thermal-insulation tests of electric ovens A. E. Kennelly, F. D. Everett, and A. A. Prior. diags Elec W 65:779-82 Mr 27 '15

See also Steam pipe coverings

Insurance, Employers' liability
Economy in insurance methods of employers.
Iron Age 95:1013-14 My 6'15

Insurance, Fire

Insurance as an aid to engineers. N. H. Daniels. Boston Soc C E J 2:91-108 Mr '15; Discussion. F. B. Sanborn; N. H. Daniels. 2:199-202 My '15

Insurance methods for payment of large losses. J. P. Gray. Textile World 49:228-30 My '15

Profitable specialty: building loss adjuster for fire insurance companies. G. D. Crain, jr. Bldg Age 37:61-2 F '15

Three kinds of insurance companies, W. H. Forse, jr. Elec Ry J 46:262-3 Ag 14 '15

Values of printing offices. C: S. Brown. Inland Ptr 56:43-5 O '15

Insurance, Health

Protection of the strong; working of German insurance laws for the protection of the poor. Sci Am S 79:343 My 29 '15

Insurance, Liability
Reciprocal liability insurance for utilities and
other electrical interests. Elec R & W Elec'n
66:1055 Je 5 '15

Insurance, Life

Group insurance offer in Brooklyn. Elec Ry J 46:252 Ag 7 '15

See also Annuities

Insurance, Sickness. See Insurance, Health

Insurance, State and compulsory
Protection of the strong; working of German
insurance laws for the protection of the
poor. Sci Am S 79:343 My 29 '15

Intake gates

Improved intake for irrigation water from a silt laden stream. A. L. Harris. diag Eng & Contr 42:184-5 Ag 19 '14

Integrating sphere

Integrating sphere and arc lamp photometry; with discussion. N. K. Chaney and E. L. Clark. Illum Eng Soc 10:1-37 no 1'15

Intemperance. See Temperance

Interborough rapid transit company, New York Comparative statement of income, profit and loss for the years ended June 30; 1914 and 1915. Elec Ry J 46:606-7 S 18 '15

Interchange of cars. See Freight cars, Interchange of

Interchangeable mechanism
Interchangeability, J. P. Brophy, Mach 21:9678 Ag '15

Interchangeable locating and clamping accessories, il diags Mach 21:580-1 Mr '15

Interest

Calculating premiums on bonds. Munic J 38: 426 Ap 1 '15
Depreciation, interest and manufacturing cost.
W. C. Wright. J Account 20:361-4 N '15
Interest rates on public utility bonds. H. S.
Welsh. Elec Ry J 45:137-8 Ja 16 '15

See also Annuities; Discount

Interferometer

Measuring one twenty-millionth of an inch. E. Keil. il plan Sci Am 112:363-4 Ap 17 '15 Use of the interferometer for the analysis of solutions. L. H. Adams, diags Am Chem Soc J 37:1181-94 My '15

Interior decoration. See House decoration

Interlocking plants
Clock-work time-lock for electric interlocking machine, il Ry Age 59:699-700 O 15 '15
Electric interlocking at Adelaide, South Australia. C. G. Pilkington, il diag Ry Age 59: 936-8 N 19 '15

Electric interlocking at Aulon, Tenn. diag Ry Age 58:932-3 Ap 30 '15

Electro-mechanical interlocking. Ry Age 59: 414 S 3 '15

Electro-mechanical interlocking at Trent W. M. Post. il diags Ry Age 59:419-20 S 3 Interlocking at North Philadelphia. Post. il Ry Age 58:136-8 Ja 22 '15 W. M.

Interlocking installation on Pacific electric. il Elec Ry J 45:946-7 My 15 '15

Interlocking tower of stucco on hollow tile, Rock Island lines. E. G. Zorn, il diags Ry R 57:108-9 Jl 24 '15

Internal combustion engines. See Gas and oil engines

Internal gear. See Motor trucks-Gearing

International association for the prevention of smoke. See Smoke prevention association

International association of chiefs of police 22d annual convention, Cincinnati, May 25-27. Munic J 38:854-5 Je 17 '15

International association of fire engineers
43d annual convention, Cincinnati, August 31September 3. Munic J 39:446-8 S 16 '15

International association of municipal

tricians

20th annual convention, Cincinnati, Aug. 24-27, Elec R & W Elec'n 67:428-30 S 4 '15

20th annual convention, Cincinnati, Aug. 2 27. Elec W 66:445-6, 513-14 Ag 28, S 4 '15 20th annual convention, Cincinnati, Aug. 24-27. Munic J 39:411-13 S 9 '15

International engineering congress, San Francisco, 1915
Abstract of proceedings. il Power 42:494-6 O 5

International engineering congress-Continued Abstract of the papers and discussions relative to railroads at San Francisco meeting. Ry Age 59:599-608 O 1 '15 Abstracts of papers. Elec Ry J 46:622-7 S 25

Brief abstracts of papers. Am Soc M E J 37:

Discussions on subjects pertaining to the electrical industry. Elec W 66:732-4 O 2 '15 Engineers hold successful congress. Iron Tr R 57:645-6 S 30 '15

Engineers hold successful congress. Iron Tr R 57:645-6 S 30 '15
Meetings of the ten sections of the congress. Eng N 74:713-15 O 7 '15
Opening session. Eng N 74:660-1 S 30 '15
Papers on metallurgy. Met & Chem Eng 13: 655-62, 721-9 O 1-15 '15
Report of electrical and related sessions. Elec R & W Elec'n 67:614-18 O 2 '15
Some of the mechanical and metallurgical subjects. Iron Age 96:780-2 S 30 '15

International gas congress, San Francisco, 1915 Opening address. A. C. Humphreys. Am Gas Light J 103:209-10 O 4 '15 Plans for the meeting in September. E. C. Jones. Am Gas Light J 102:161-2 Mr 15 '15

International institute of agriculture New internationalism in agriculture, H. C. Price, Sci Am S 80:109 Ag 14 '15

International law
War and the British engineer; trading with
the enemy; a comparison. Engineer 119:
114-15 Ja 29 '15

See also Peace; War

International nickel company
Canada's nickel trouble. Eng & Min J 99:30-1
Ja 2 '15

International railroad master blacksmiths' association

23d annual convention, Philadelphia, Aug. 17-19. Ry Age 59:387-9 Ag 27'15 23d annual convention, Philadelphia, Aug. 17-19. Ry Age (Mech ed) 89:471-81 S'15

If the the third in the third i

International railway general foremen's association

Attor 11th annual convention, Chicago, July 13-16. Ry Age 59:102-4, 155-8 Jl 16-23 '15 11th annual convention, Chicago, July 13-16. Ry Age (Mech ed) 89:417-26 Ag '15 11th annual convention, Chicago, July 13-16. Ry R 57:76-9, 118-20 Jl 17-24 '15

International typographical union
61st convention, Los Angeles. Inland Ptr 55:
833-5 S '15

Interrupters

Denatured electric current: an Italian device by which a heating circuit is useless for lighting. G. Pincherle, diag Eng M 48:739-40

Interstate commerce nterstate commerce
Interstate commerce commission and its work.
E. E. Clark. Ry Age 59:493-6 S 17 '15; Excerpts (Changes in the Interstate commerce law) Ry R 57:400-3 S 25 '15
Interstate commerce defined; remarks of Justice Day of Supreme court in South Covington & Cincinnati street railway case. Elec Ry J 45:150 Ja 16 '15
Interstate commerce transcends state law.
A. P. Nevin. Am Ind 15:26-7 Ap '15

See also Railroads—Rates; Railroads and states—United States

states-United States

Interstate commerce commission
Absentee landlordism and the commission. Ry
Age 57:1072 D 11 '14

Annual report. Ry R 55:748-50; 56:20-4, 159-64 D 19, '14, Ja 2, 30 '15

Argument on authority of Interstate commerce commission to require reports of accidents and other statistics from urban railways. J: T. Beasley. Elec Ry J 44:1389-90 D 26'14

Government regulation of railway operation. S: O. Dunn. Ry Age 58:184-7 Ja 29 '15

Instructions for roadway and track men on federal valuation; abstract of second tentative draft issued by Interstate commerce commission. Eng Rec 70:638-40 D 12 '14; Ry Age 58:62-4 Ja 8 '15
Interstate commerce commission and its work. E. E. Clark. Ry Age 59:493-6 S 17 '15; Same. Eng & Contr 44:273-6 O 6 '15
Interstate commerce commission refuses to decide international jurisdiction. Ry R 56: 665-6 My 15 '15
Private car lines not common carriers. Ry Age 58:1051-2 My 21 '15
Railway regulation handicapped by muddled official statistics. Ry R 56:130-1 Ja 23 '15
Recommendations of Interstate commerce commission and parts of report of general interest to electric railways. Elec Ry J 44: 1358-9 D 19 '14
Reorganization. Ry R 56:17-18 Ja 2 '15
Report of the chief inspector, division of safety. H. W. Belnap. Ry R 56:226-7 F 13 '15
Report on the Rock Island. Ry Age 59:323-7 Ag 20 '15
28th annual report. Ry Age 57:1086-7 D 11 '14

28th annual report. Ry Age 57:1086-7 D 11 '14 Va!uation conference in Washington, March 22. Eng Rec 71:324-5 Mr 13 '15

22. Eng Rec 71:324-5 Mr 13 '15
Interurban railroads
1500-volt interstate interurban railway; O., L.
& I. Ry. il map Elec Ry J 46:1073-4 N 27 '15
Interurban as an agency of transportation.
J. F. McClure. Elec Ry J 46:1077-8 N 27 '15
Operation of the Pacific electric railway. il
map Ry Age 59:225-9 Ag 6 '15
Seven years of operating experience of a single-phase interurban railway; Chicago, Lake
Shore & South Bend railway. il map Elec
Ry J 46:940-5 N 6 '15

See also Electric railroads

Intoxication. See Temperance

Intrenchments

In the trenches. G. Lenotre. Sci Am 112:416+ My 1 '15

Protecting the frontier. il Sci Am S 80:284 O 30 '15

Trench warfare; ten hours of trench digging for ten minutes of rifle fire. W. D. A. Ander-son. il Sci Am 113:6-8 Jl 3 '15

Invar

Medal for the inventor of invar. Sci Am 112: 327+ Ap 3'15

Inventions

Governmental indifference to invention. Sci Am 113:74 Jl 24 '15 Great inventions and the public. Sci Am S 80:170 S 11 '15 Greatest ten years of invention. Sci Am 112: 510 Je 5 '15

Inventions wanted. Sci Am 112:488 My 29 '15 Inventor's show at New York, il Sci Am 111: 528 D 26 '14

Nothing more to invent? Sci Am 113:334 O 16

Patent office and invention since 1845. W: I. Wyman. Sci Am 112:533-4+ Je 5 '15

Practical devices and the lack of capital. C: E. Duryea. Sci Am 113:119 Ag 7

Prizes for scientists. Sci Am S 80:228 O 9 '15 Seventy years of inventions, il Sci Am 112:511-20+ Je 5 '15 Tasks of German inventors in wartime. Sci Am 113:214+ S 4 '15

See also Inventors; Patents; Phonopticon

Inventories

Four-part factory inventory system. H. A. Russell. Iron Age 95:1218-25 Je 3 '15

Inventory for printers. Inland Ptr 54:692-3 F

Perpetual inventory in practical stores operation. J. B. Green. Eng M 48:879-88 Mr '15

Suggested form of inventory for valuation of common carrier property. D. F. Jurgensen. Assn Eng Soc J 55:129-38 O '15

Symposium on inventories and appraisals of properties. C. L. Cory; W. G. Vincent, jr.; W; J. Norton. Am Inst E E Pro 34:2131-58 S '15

Valuation of merchandise inventories. J Account 18:461-3 D '14

Inventors

Inventors and the war. Sci Am 113:17 Jl 3 '15 Inventors' bank. Sci Am S 79:262 Ap 24 '15 Inventors too cautious. Sci Am 113:106 Ag 7 '15 See also Inventions

Investments

Investment banker and the engineer, C; A. Hobein. Assn Eng Soc J 54:237-57 Je '15 See also Annuities; Bonds; Securities

Permanganate and iodimetric determination of iodide in presence of chloride and brom-ide, P. L. Barnebey. Am Chem Soc J 37:

lodine

Free energy of iodine compounds. G. N. Lewis and M. Randall. Am Chem Soc J 36:2259-68 N '14

Iodine number of linseed and petroleum oils. W. H. Smith and J. B. Tuttle. U S Bur Stand Tech Pa 37:1-17 '14; Same. J Ind & Eng Chem 6:994-8 D '14 Study of the system: water, potassium iodide and iodine at zero degrees. G. Jones and M. L.; Hartmann. Am Chem Soc J 37:241-58 F '15

Use of iodine as a dehydrating and condensing agent. H. Hibbert. Am Chem Soc J 37:1748-63 Jl '15

Vapor pressure of iodine between 50° and 95°. G. P. Baxter and M. R. Grose, Am Chem Soc J 37:1061-72 My '15

Iodoanil

ction of nitric acid on iodoanil. L. Clarke and E. K. Bolton. Am Chem Soc J 36:1899-1908 S '14 Action

Ionization

Atoms and ions. J. J. Thomson. Sci Am S 79: 274, 290-1, 310-11, 326-7, 346-7, 362-3 My 1-Je 5 '15

Electric strength of air. J. B. Whitehead. Am Inst E E Pro 34:843-65 My '15; Discussion. 34:2997-3005 D '15

Osmotic pressure and concentration in solutions of electrolytes, and the calculation of the degree of ionization. S. J. Bates. Am Chem Soc J 37:1421-45 Je '15

Photo-electricity; the intimate relations of light and electricity. J. A. Fleming. Sci Am S 80:18-19 Jl 10 '15

Radiometric measurements of the ionization constants of indicators. E. J. Shaeffer, M. C. Paulus, and H. C. Jones. diags Am Chem Soc J '37:776-807 Ap '15

constants of indicators. M. G. Paulus, J. F. Hutchinson and H. C. Jones. Am Chem Soc J 37:1694-1704 JI '15 Radiometric measurements

Theoretical and experimental consideration of electrical precipitation, A. F. Nesbit, il diags Am Inst E E Pro 34:507-22 Ap '15; Discussion. 34:2646-52 N '15

See also Radioactivity

Action of certain colloids on ions during electrolysis. A. Mutscheller, diags Met & Chem Eng 13:353-7 Je '15

Atoms and ions. J. J. Thomson. Sci Am S 79: 274, 290-1, 310-11, 326-7, 346-7, 362-3 My 1-Je 5 '15

Development in electromagnetism. E. Bloch. Sci Am S 79:366-7 Je 5 '15

Hydrogen- and hydroxyl-ion activities of solutions of hydrochloric acid, sodium and potassium hydroxides in the presence of neutral salts. H. S. Harned, diag Am Chem Soc J 37:2460-82 N 15

Larger ions in the air. J. A. Pollock. Sci Am S 80:75 Jl 31 '15

Reactions of sodium ethylate with methyl iodide in absolute ethyl alcohol at 25°. H. C. Robertson, jr. and S. F. Acree. Am Chem Soc J 37:1902-9 Ag '15

Reinterpretation of the reactions of sodium methylate and sodium ethylate with 1, 2-dinitrobenzene, and 1, 2, 4-dinitrochlorobenz zene and 1, 2, 4,-dinitrobromobenzene. S. F. Acree. Am Chem Soc J 37:1909-14 Ag '15

Relative migration velocities of the ions in complex electrolytes. A. M. Chem Eng 13:439-42 Jl '15 Mutscheller, Met &

See also Dissociation; Electrochemistry; Electrolysis; Electrons; Ionization; Solution (chemistry)

lowa electrical contractors' association 4th semi-annual convention, Keokuk, April 20-22. Elec R & W Elec'n 66:810 My 1 '15

lowa state association of master plumbers 27th annual convention at Davenport. Dom Eng 70:151-3 Ja 30 '15 27th annual convention, Jan. 19-21, 1915. Metal Work 83:208-9 Ja 29 '15

lowa street & interurban railway association
12th annual convention, Keokuk, April 22-23.
Elec Ry J 45:839-41 My 1 '15

Iquitos, Peru

Sanitaty affairs
Sanitation of Iquitos, Peru. G. M. Converse,
il Eng N 73:201 F 4 '15

Corrosion of iron. L. C. Wilson. Eng M 48: 517-23, 667-74, 849-58; 49:58-66, 202-10 Ja-My '15 Determination of ferrous iron in silicates by

Determination of ferrous iron in silicates by titration with dichromate. O. L. Barnebey. Am Chem Soc J 37:1829-35 Ag '15

Effect of boron upon the magnetic and other properties of electrolytic iron melted in vacuo. T. D. Yensen. il Ill U Eng Exp Sta Bul 77:1-19 '15

Electrical resistance and critical ranges of pure iron. G. K. Burgess and I. N. Kellberg. U S Bur Stand Bul 11:457-70 My 10 '15

Electrolytic corrosion of iron in soils. B. Mc-Collum and K. H. Logan. U S Bur Stand Tech Pa 25:1-69 '13; Abstract. J Fr Inst 180: 228-32 Ag '15

Electrolytic iron; abstracts. L. Guillet. Met & Chem Eng 12:787 D '14; Eng M 49:928-9 S '15; J Fr Inst 180:461-2 O '15

Influence of different elements on the corrosion of iron. L. C. Wilson. Eng M 50:78-86 O '15

Interference measurements of wave lengths in the iron spectrum (2851-3701). K. Burns and W. F. Meggers. U S Bur Stand Bul 12:179-205 N 8 '15; Abstract. J Fr Inst 180:375-6 S

Iron in tomatoes. C. A. Brautlecht and G. Crawford. J Ind & Eng Chem 6:1001-2 D 14

'14
'14
Magnetic and other properties of electrolytic iron melted in vacuo. T. D. Yensen. pl Am Inst E E Pro 34:237-61 F '15; Abstract. Sci Am S 79:247 Ap 17 '15
Magnetic behaviour of iron under alternating magnetization of sinusoidal wave-form. N. W. McLachlan. diags Inst E E J 53:809-19 Je 15 '15

Magnetic studies of mechanical deformation in

Je 15 '15
Magnetic studies of mechanical deformation in certain ferromagnetic metals and alloys. H. Hanemann and P. D. Merica. il Am Inst Min E Bul 108:2371-85 D '15
Metallic iron in coke samples. J. R. Campbell. Colliery 35:538-41 My '15
99.84-per-cent-pure iron for electrical purposes. il Elec W 66:213-14 Jl 24 '15
Passivity of metals. H. G. Byers and S. C. Langdon. diags Am Chem Soc J 36:2004-11

O'14
Permanganate determination of iron in the presence of fluorides—the analysis of silicates and carbonates for their ferrous iron content. O. L. Barnebey. Am Chem Soc J 37:1481-96 Je '15
Protective coatings for iron and steel. E. P. Later. Foundry 42:497-8; 43:35.+ D '14-Ja '15
Rust removal by chemical reagents. J. N. Friend and C. W. Marshall. Iron Tr R 56: 1023-4 My 20 '15
Symposium on iron and steel. Met & Chem Eng 13:655-7 O 1 '15
Why iron and steel corrode. J. Aston. Iron Tr R 56:423-6 F 25 '15
See also Blast furnaces: Cast iron: Chilled

Re also Blast furnaces; Cast iron; Chilled iron; Corrosion and anti-corrosives; Corrugated iron; Foundry practice; Galvanizing; Iron alloys; Iron founding; Iron industry; Iron metallurgy; Iron mines and mining; Iron ores; Metallography; Pig iron; Slag; Steel; Wrought iron

Iron -Continued

Analysis

Analysis

Analoid method for the determination of manganese in steel, iron ore and slag. Met & Chem Eng 12:793-4 D '14

Analoid method for the determination of phosphorus in steel, iron and slag. Met & Chem Eng 13:191-2 Mr '15

Determination of boron in iron. J. M. Lindgren. Am Chem Soc J 37:1137-9 My '15

Method for determining gases in steel. P. Goerens and J. Paguet. diag Iron Age 95: 1060-1 My 13 '15

Testing

Iron-cobalt alloy, FE $_2$ CO, and its magnetic properties. T. D. Yensen. il Gen Elec R 18: 881-7 S '15

Iron, Corrugated, See Corrugated iron

alloys

on alloys

Effect of boron upon the magnetic and other
properties of electrolytic iron melted in
vacuo. T. D. Yensen. il Ill U Eng Exp Sta
Bul 77:1-19 15 Iron-cobalt alloy, FE<sub>2</sub>CO, and its magnetic properties. T. D. Yensen. il Gen Elec R 18; 881-7 S '15

881-7 S '15

Magnetic properties of some iron alloys melted in vacuo. T. D. Yensen, il diag Am Inst E E Pro 34:2455-95 O '15

Manufacture of ferro-alloys in the electric furnace. R. M. Keeney. diags U S Bur Mines Bul 77:102-85 '14; Excerpts. Iron Tr R 56: 717-22+, 765-7+, 862-7-4 Ap 8-15, 29 '15

Phenomenon of passivity in connection with ferrous alloys of different composition and structure. H. W. Moseley. Am Chem Soc J 37:2326-33 O '15

See also Ferrophosphorus; Ferrovanadium; Invar; Spiegeleisen

and steel electrical engineers, Association f. See Association of iron and steel electrical engineers

Iron and steel institute
Annual meeting. il Engineer 119:500-2, 527-8
My 21-28 '15

Autumn meeting, London, Sept. 23-24. Engineer 120: 313-14, 334-6 O 1-8 '15
Autumn meeting, London, Sept. 23. Iron Tr R 57:798-9 O 21 '15

Iron and steel institute, American. See American iron and steel institute

Iron carbides

Carburisation of iron at low temperatures in Carburisation of iron at low temperatures in blast furnace gases; abstracts, with discussion, T. H. Byrom. Engineer 120:335 O 8 '15; Iron Age 96:1176-8 N 18 '15 Constitution of the iron-carbon alloys: a chemial theory to explain the different properties by the existence of ferrated carbides. G: Auchy. Iron Age 95:50-1 Ja 7 '15

Iron-carbon diagram

Modified iron-carbon diagram. E. A. Sperry. Met & Chem Eng 13:469-71 Ag '15

Iron founding

or founding
Blow holes and sulphur, R. A. Pitman, Foundry 43:95-6 Mr '15
Blow-holes in a casting, W. J. Keep; C. E. Lyall, Foundry 43:262, 304-5 Jl-Ag '15
Casting iron around pipe, E. A. Vaupel, diag Foundry 43:241 Je '15
Castings from blast furnace, Iron Age 96:1054
N 4 '15
Carpenting of analysis and shripkage W. I.

N 4 '15
Comparison of analysis and shrinkage. W. J. Keep. Foundry 43:58-9 F '15
Continuous malleable cupola practice increasing output of malleable castings. L. E. Gilmore. Iron Age 95:306-8 F 4'15
Control of chill in cast iron, considering the elements effective in the manufacture of malleable castings and chilled car wheels. G. M. Thrasher, il Am Inst Min E Bul 106: 2129-38 O'15; Same. Foundry 43:491-3+ D'15; Same. Iron Tr R 57:1171-3+ D 16'15; Excerpt (Natural chill of cast iron) Met & Chem Eng 13:39-40 Ja'15
Controlling the sulphur in melting pig iron. W M. Carr. Foundry 43:189-90, 310 My, Ag

Dull iron. W. J. Keep. Foundry 43:382 S '15 Fuel ratio for car wheel iron. A. S. Dowler. Foundry 43:97-8 Mr '15

Fuel ratio on car wheel iron. W. J. Keep. Foundry 43:51-2 F '15 History of a bad furnace cast. W. G. Imhoff. Iron Tr R 57:131-2 Jl 15 '15 Loss in melting. W. J. Keep. Foundry 43:272 Jl '15

Low carbon pig iron for iron castings. Iron Age 95:796-7 Ap 8 '15
Making car wheels at the Lenoir car works.
G. S. Evans. Foundry 43:351-3, 428-31, 435-9
S-N '15

Malleable iron castings for the automobile in-

Malleable iron castings for the automobile industry. R: Moldenke. Horseless Age 35:69-72 Ja 13 '15

Mixture for chilled crusher rolls. W. J. Keep. Foundry 43:187 My '15

Modern foundry pig-iron mixer; operating and chemical results with blast-furnace and coke-oven gases; abstract. O. Simmersbach. Iron Age 96:812-13 O 7 '15

Modern iron founding. R. Onions, il diags Engineer 119:411-13 Ap 23 '15

Molding air compressors on jolt-rammers, il Foundry 43:18-19 Ja '15

Molding cast-iron tunnel linings. L: J. Josten. il Iron Age 95:715-19 Ap 1 '15

Molten iron boiling in ladles. W. J. Keep. Foundry 43:49 N '15

Old and new methods of making carwheels. C: V. Slocum, diags Iron Age 96:676-9 S 23

C:

Opportunities for the foundry engineer. W. F. Prince. Foundry 43:63-4 F '15
Overcoming slag and dirt in gray iron. P. R. Micks. Foundry 43:186-7 My '15
Phosphorus limit in malleable castings. E. Touceda. il Iron Tr R 57:634-6 S 30 '15; Same. Foundry 43:446-9 N '15; Same cond. Iron Age 96:924-6 O 21 '15
Pin holes and internal shrinkage. W. J. Keep. Foundry 43:19-20 Ja '15
Pouring systems for gray-iron foundries. il Iron Age 96:1123-5 N 11 '15
Shot in gray iron. W. M. Carr. Foundry 43:52 F '15
Shot in gray iron castings. R. A. Pitman. Foundry 43:10 Mr '15

Shot in gray iron castings. R. A. Pitman, Foundry 43:103 Mr '15
Slow melting in the cupola. C. Metcalf. Foundry 43:106 Mr '15
Slow melting in the cupola. J. H. Anderson. Foundry 43:180-1 My '15
Standardizing air furnace practice, A. L. Pollard. Foundry 43:412-13 O '15
Test on melting shot iron in the cupola; experiment in a stove foundry. G. E. Pickup, il Foundry 42:467-8 D '14

See also Cast iron: Foundry practice;

See also Cast iron; Foundry practice; Molding machines

Iron handling

Handling iron and cinder at the blast fur-nace. J. E. Johnson, jr. il diags Met & Chem Eng 13:43-50 Ja '15

Iron industry and trade
British India. U S Sp Cons Rep 72:205-14 '15
British iron and steel trade in 1914. Iron Age
95:144-5 Ja 14 '15
Charts showing fluctuations in iron and steel
prices for twenty years. Iron Tr R 56:8a

prices for Ja 7 '15

prices for twenty years. Iron Tr K 50:8a Ja 7 '15
Chicago iron trade in 1914. O. J. Abell. Iron Age 95:2-4 Ja 7 '15
Cincinnati iron trade in 1914. C: L. Smith. Iron Age 95:8-10 Ja 7 '15
Cincinnati iron trade in 1914. C: L. Smith. Iron Age 95:8-10 Ja 7 '15
Cincinnati market's gloomy year. S. G. Backman. Iron Tr R 56:103+ Ja 7 '15
European iron and steel in 1914. Eng & Min J 99:269-70 F6 '15
Few furnaces completed in 1914. R. V. Sawhill. Iron Tr R 55:1233-4 D 31 '14
French steel plants in war time. F. Miltoun. Iron Age 95:940-2 Ap 29 '15
Future of Birmingham district. R. R. Silver. il Iron Tr R 56:135-6 Ja 14 '15
Germany's steel output for August. Iron Age 96:882 O 14 '15
Independents are conspicuous: developments of the past year on Minnesota iron ranges. H. C. Estep. il Iron Tr R 56:172-81 Ja 7 '15
Iron a factor in the world's progress. J: Birkinbine. J Fr Inst 179:471-88 Ap '15: Same cond. Iron Tr R 56:1059-62 My 27 '15; Excerpts. Sci Am S 80:326 N 20 '15
Iron and steel market at Fittsburgh in 1914.

Iron and steel market at Pittsburgh in 1914. C. F. Williams. Iron Tr R 56:40-4 Ja 7 '15

Iron industry and trade -Continued

Iron and steel prices for seventeen years. Iron Age 95:16-17 Ja 7'15

Iron and steel statistics. F: Hobart. Eng & Min

Iron and steel statistics. F: Hobart. Eng & Min J 99:70-1 Ja 9 '15
Iron industry in Brazil. E. C. Harder. il maps Am Inst Min E Bul 94:2573-86 O '14; Same cond. Iron Tr 1; 55:718-29 + O 15 '14; Same cond. Metal Work 84:143-5+ Jl 30 '15; Abstract. Iron Age 94:888-9 O 15 '14; Discussion. Am Inst Min E Bul 100:813-16 Ap '15
Iron industry in Europe. Eng & Min J 99:833 My 8 '15

My 8 '15
Iron ore supplies for seaboard furnaces. E. C. Eckel. il map Iron Age 95:69-73 Ja 7 '15
Iron, steel and coal in Dixie. H. S. Chamberlain. Iron Tr R 56:176-8+ Ja 21 '15
Lake iron ore prices. Eng & Min J 99:790-1
My 1 '15
Lake Superior iron conditions. Eng & Min J 100:443-4 S 11 '15
Lake Superior iron ore. Eng & Min J 99:24 Ja

Lake Superior iron ore. Eng & Min J 99:24 Ja 2 '15
Lake Superior iron ranges; the 1914 season. Eng & Min J 99:73-6 Ja 9 '15
Last year's iron ore prices prevail. Iron Tr R 56:804-6 Ap 22 '15
Light ore movement to the east. C. J. Stark. il map Iron Tr R 56:137-42 Ja 14 '15
Location of the iron industry. R. Olds. Eng & Min J 99:502-3 Mr 13 '15
M. A. Hanna & co. sell Hill ore. Iron Tr R 55: 1027 D 3 '14
Minette iron ores of the Lorraine district.
H. H. Campbell. Iron Age 96:168-9 Jl 15 '15
Money and iron: fact, comment. Iron Tr R 56:212-13, 294-5 Ja 28-F 4 '15
More steel-works iron. Iron Age 95:344 F 4 '15
Much more merchant ore from lake mines.
D. E. Woodbridge. Iron Age 95:148-9 Ja 14 '15
Neglecting the export market for southern iron. P. G. Donald. Am Ind 15:21 My '15
Pacific coast iron situation; the iron ores of California and possibilities of smelting. C: C.
Jones. map Am Inst Min E Bul 105:1887-98
S '15; Discussion. 108:2496-501 D '15
Philadelphia iron trade in 1914. C: Lundberg. Iron Age 95:7-8 Ja 7 '15
Pittsburgh iron and steel markets. B. E. V.
Luty. map Eng & Min J 99:72-3 Ja 9 '15
Pittsburgh iron trade in 1914. R. A. Walker. Iron Age 95:5-6 Ja 7 '15
Production of wrought pipe, cast pipe and galvanized sheets in 1913. Iron Age 94:1514 D 31 '14
Selling price of castings. A. O. Backert. Iron Tr R 56:228-30+ Ja 28 '15

Vanized sneets in 1915, Iron Age 94:1514 D 31 '14'
Selling price of castings. A. O. Backert, Iron Tr R 56:228-30+ Ja 28 '15'
Some aspects of the iron and steel industry in Europe. U S Sp Cons Rep 71:1-48 '15'
Survey of events in England: effects of the great war on iron and steel. J. Horton. Iron Tr R 56:54-6, 82 Ja 7 '15'
Tendencies in the location of the iron industry. Eng & Min J 99:505-6 Mr 13 '15'
Wages and hours of labor in the iron and steel industry, table Mach 21:954 Ag '15'
War and the export trade. C. J. Stark. Iron Tr R 56:31-2, 90-4 Ja 7 '15'
Year of disappointment in East. C. J. Stark. Iron Tr R 56:38-9, 97-9 Ja 7 '15'
Year of low prices at Chicago. G: H. Manlove. Iron Tr R 56:36-7 Ja 7 '15'
Year of retrogression in the iron trade. Iron Age 95:1-2 Ja 7 '15'
See also Foundry practice; Iron mines and

See also Foundry practice: Iron mines and mining; Pig iron; Rolling mills; Scrap metal; Steel industry; Stoves; United States steel corporation

Iron metallurgy

con metallurgy

Bosh fuel domes. F: L: Grammer, diag Eng

Soc W Pa 31:609-20 O '15

Chemical principles of the blast furnace. J. E.

Johnson, jr. Met & Chem Eng 13:536-43,

634-8 S 1-15 '15

Concentrating plant of the Moose Mountain,

Ltd. B. B. Hood. il diag Eng & Min J 99:

973-6 Je 5 '15

973-6 Je 5 '15 Concentration by the Goltra process: beneficiation of brown iron ores by means of a current of hot air and properly located screens. W: B. Phillips. Iron Age 94:1148-50 N 12 '14; Abstract. Eng M 48:582-5 Ja '15 Contributions of the chemist to the iron and steel industry. A. S. Cushman. J Ind & Eng Chem 7:934-5 N '15

Crude oil as a reducing agent, Iron Tr R 56: 525-6 Mr 11 '15
Desulphurization in cupola practice. Iron Age 96:468-9 Ag 26 '15
Electric pig iron in Norway; a new type of furnace using coke successfully—cost data. diags Iron Age 95:1120 My 20 '15
Electro-thermic iron-ore smelting in Scandinavia. Eng & Min J 100:351-2 Ag 28 '15
Evolution of the malleable process. J. P. Pero and J. C. Nulsen, Iron Age 96:1168-70 N 18 '15
Handling iron and cinder at the blast furnace.

'15
Handling iron and cinder at the blast furnace.
J. E. Johnson, jr. il diags Met & Chem Eng
13:43-50, 85-9 Ja-F '15
High blast heats in Mesaba practice. W. Mathesius. Am Inst Min E Bul 99:539-55 Mr '15;
Same cond. Iron Age 95:475-8 F 25 '15; Same cond. Iron Tr R 56:365-6, 368 F 18 '15; Discussion. Am Inst Min E Bul 101:1100-7 My

Iron manufacture by electrolysis. L. Guillet. Il Iron Age 94:1390-2 D 17 '14; Same. Sci Am S 79:70-1 Ja 30 '15 Leaching experiments on the Ajo ores. S. Croasdale. Am Inst Min E Bul 92:1919-24 Ag '14; Excerpt (Manufacture of sponge iron as a precipitant for copper). Eng & Min J 99: 326-8 F 13 '15

Magnetic-concentration mill at Mt. Hope, N. J. S: Shapira. il diags Eng & Min J 99:559-65 Mr 27 '15

Mr 27 '15

Manufacture and use of pure iron. H. See. il
Assn Eng Soc J 54:133-41 Ap '15

Oxy-acetylene welding practice; metallurgy of
iron and its relation to welding. S. W. Miller. il Mach 22:215 N '15

Possible applications of oxygen in metallurgy.
J. E. Johnson, jr. Met & Chem Eng 13:483-4
Ag '15

Progress in blast furnace practice. A. E. Mac-

Progress in blast furnace practice. A. E. Maccoun. Iron Tr R 56:1129-31, 1167-9, 1255-64
Je 3-17 '15

Je 3-17 '15 The total state of the control of the c

9 '15
Slags from titaniferous ores. F. E. Bachman.
diag Iron Tr R 55:1040-2 D 3 '14
Technical progress in iron and steel in 1914.
J. E. Johnson, jr. Iron Age 95:19-23 Ja 7 '15
Thermal principles of the blast furnace. J. E.
Johnson, jr. Met & Chem Eng 13:718-20, 78792, 833-40, 905-10, 954-62 O 15-D 15 '15
Titaniferous ores in the blast furnace. F. E.
Bachman. Iron Age 94:1470-1; Discussion.
A. H. Lee; R. H. Lee. 94:1471-3 D 24 '14
Vanadium in German ores. L. Blum. Iron Age
95:847 Ap 15 '15
Washed metal. H: D. Hibbard. ij plan Am
Inst Min E Bul 108:2387-94 D '15
See also Blast furnaces; Case hardening;

See also Blast furnaces; Case hardening; Cast iron; Corrosion and anti-corrosives; Foundry practice; Galvanizing; Iron alloys; Iron mines and mining; Metallography; Pigiron; Slag; Steel metallurgy; Wrought iron

Iron mines and mining

See also Iron ores

Chile

Operations at the Tofo iron mines in 1914. map Iron Age 94:1448-9 D 24 '14

Tofó iron mines in 1914. C. A. Buck. map Eng & Min J 99:145-6 Ja 16 '15

Iron-mining situation in north China. Eng & Min J 99:786 My 1 '15

Lake Superior region

Lake Superior iron ranges; t Eng & Min J 99:73-6 Ja 9 '15 the 1914 season.

Little activity on old ranges. Iron Tr R 56:232-3 Ja 28 '15

Iron mines and mining -Continued

Michigan

Michigan

Electrical plant of the Wakefield iron co. H. I.
Pearl and J. Green, il plan Eng & Min J
100:349-51 Ag 28 '15

Finding the Judson orebody. L. E. Ives. il
map Eng & Min J 99:443-5 Mr 6 '15

Investments in Iron river district, C. A. Tupper, il Iron Tr R 56:759-64 Ap 15 '15

Marquette range sixty years ago. R. Kelly. Eng
& Min J 99:201 Ja 23 '15

Mining methods on Gogebic range. O. E. Olson, O. M. Schaus and F. Blackwell, diags
Iron Tr R 57:753-7 O 14 '15

Observations on the appraisal of the iron mines

Iron Tr R 57:733-7 O 14 '15 Observations on the appraisal of the iron mines of Michigan. C. H. Baxter. Eng & Min J 99:439-40 Mr 6 '15 Open pit mining on Gogebic range. W. C. Hart. Iron Tr R 57:523-5 S 16 '15

#### Minnesota

Minnesota

Exploration work on Cuyuna range, P. W. Donovan, Iron Tr R 57:534+ S 16 '15

Good results in south range on the Cuyuna. Iron Tr R 57:563-4 Ag 19 '15

Independents are conspicuous: developments of the past year on Minnesota iron ranges. H. C. Estep. il Iron Tr R 56:72-81 Ja 7 '15

Lake Superior mining institute 20th annual meeting, il Iron Tr R 57:542-5 S 16 '15

Manganiferous iron ores of the Cuyuna range. E: P. McCarty, Eng & Min J 100:400-2 S 4 '15

Orebodies of the Mesabi range. J. F. Wolff. il map Eng & Min J 100:89-94, 135-9, 178-85, 219-24 Jl 17-Ag 7 '15 Structure of the Cuyuna iron-ore district of Minnesota. C: A. Cheney, jr. map Eng & Min J 99:1113-15 Je 26 '15

#### New Jersey

evelop nation's oldest iron mine: Empire steel & iron co.'s Mount Hope properties. H. M. Roche and J. C. Stoddard, il plans Iron Tr R 57:171-6+ J1 22 '15 Develop

New York (state)

Improvements at Port Henry iron mines. diags Iron Age 95:1390-2 Je 24 '15

Russia—its future as a coal and iron producer. C: R. King. map Eng M 48:481-92 Ja '15

Russia—its future as a coal and iron producer. C: R. King. map Eng M 48:481-92 Ja '15

Iron ores
Additional data on origin of lateritic iron ores of eastern Cuba. C. K. Leith and W. J. Mead. Am Inst Min E Bul 103:1377-80 JI '15
Ancient sedimentary iron ores of British India. C. M. Weld. maps Econ Geol 10:435-52 JI '15
Decline in production of iron ore. Metal Work 83:338 Mr 12 '15
Drying iron ore on the Mesabi range. E. J. Collins. Eng & Min J 99:696-7 Ap 17 '15
Exploring for Adirondack ores. C. S. Clark. il map Iron Tr R 56:617-19 Mr 25 '15
Formation and distribution of bog iron-ore deposits. C. L. Dake. Am Inst Min E Bul 103:1429-36 JI '15; Excerpts. Eng & Min J 100:74-5 JI 10 '15; Excerpts. Iron Tr R 57: 486 S 9 '15: Discussion. Am Inst Min E Bul 108:2475-6 D '15
Formation and distribution of residual iron ores. C. L. Dake. Am Inst Min E Bul 101: 937-46 My '15
Geology of the iron-ore deposits in and near Daiquiri, Cuba. J. F. Kemp. il diags map Am Inst Min E Bul 105:1801-36 S '15; Discussion. 108:2472 D '15
Iron deposits of Daiquiri, Cuba. W. Lindgren and C. P. Ross. bibliog il Am Inst Min E Bul 106:2171-90 O '15
Iron industry in Brazil. E. C. Harder. il maps Am Inst Min E Bul 94:2573-86 O '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Same cond. Iron Tr R 55:718-20+ O 15 '14; Discussion. Am Inst Min E Bul 100:313-16 Ap '15
Iron ore supplies for seaboard furnaces. E. C. Eckel. il map Iron Ag

Mayari iron-ore deposits, Cuba. J. F. Kemp. Am Inst Min E Bul 98:129-54; 103:1461-2 Jl '15

Minette iron ores of the Lorraine district. H. H. Campbell. Iron Age 96:168-9 Jl 15 '15 New method of making sieve tests. R. H. Bassett. Iron Tr R 57:230+ Jl 29 '15 Ore reserves in United States. J: Birkinbine. Iron Tr R 55:1046+ D 3 '14 Orebodies of the Mesabi range. J. F. Wolff. il map Eng & Min J 100:89-94, 135-9, 178-85, 219-24 Jl 17-Ag 7 '15 Oriskany iron ores of Virginia. C. M. Weld. maps Econ Geol 10:339-421 Jl '15 Pacific coast iron situation; the iron ores of California and possibilities of smelting. C: C. Jones. map Am Inst Min E Bul 105:1887-98

S'15
Problems in iron ore geology in Sweden and in America. P. Geijer. il Econ Geol 10:299-329 Je'15
Progress in blast furnace practice. A. N. Diehl. Iron Tr R 57:28-9, 31 Jl 1 '15
Structure of the Cuyuna iron-ore district of Minnesota. C: A. Cheney, jr. map Eng & Min J 99:1113-15 Je 26 '15
Titanium and titaniferous ores. P. H. Berggreen. Sibley J 29:227-30 Ap '15

See also Iron mines and mining: Pyrite

Iron oxide

Emissivity of metals and oxides; iron oxide. G: K. Burgess and P. D. Foote. U S Bur Stand Bul 12:83-9 O 28 '15

Iron works

on works

Cockerill iron works. il Sci Am S 78:389-90 D
19 '14

Furnace improvements at plant of Jackson
Iron & steel co., Jackson, O. il diags Iron
Tr R 56:724-7 Ap 8 '15

Gas and steam engines and the turbine. J. E.
Johnson, jr. Iron Age 95:626-9 Mr 18 '15;
Same. Sci Am S 79:294-5 My 8 '15

Modern plant for rolling iron: St. Louis screw
co. H. C. Estep. il diags plans Iron Tr R
57:82-9+ Jl 8 '15

New iron and steel works construction. Iron
Age 95:30-2 Ja 7 '15

New iron mill equipped to assure low costs,
with diagram of layout. O. J. Abell. il Iron
Age 96:71-7 Jl 8 '15

New Taylor-Wharton plant with diagram of
layout, il Iron Tr R 57:794-7+ O 21 '15

Six etchings of European iron and steel works.
J. Pennell. Iron Tr R 56:57-64 Ja 7 '15

Washington iron works, including foundry,
machine, boiler and forge shops. F. A.
Churchill, jr. il Iron Tr R 55:1043-5+ D 3 '14

Sec also Forge shops; Foundries See also Forge shops; Foundries

Irons, Electric, See Electric irons

Ironwork

Iron manufacture by electrolysis. L. Guillet, il Iron Age 94:1390-2 D 17 '14; Same. Sci Am S 79:70-1 Ja 30 '15

Removing iron scale by pickling; theory vs. practice, C. Hering. Met & Chem Eng 13: 785-6 N 1 '15

See also Blacksmithing; Forging; Tin plate; Welding; Wrought iron

Ironwork, Architectural Ironwork from Rome and Tuscany. J: S. Scarff. il diags Brickb 24:63-6 Mr '15 See also Sheet metal work, Architectural

Irrigation

rigation
Allowing for irrigable lands not irrigated.
P. A. Cooper. Eng N 73:405-6 F 25 '15
Does irrigation pay? F. H. Newell. Eng Rec 72:384-5 S 25 '15
Electricity for irrigation pumping. il Elec R & W Elec'n 66:1022-8 Je 5 '15
Electricity in agriculture. C. J. Rohrer. il Gen Elec R 18:486-8 Je '15; Same, Sci Am S 80: 265 O 23 '15
Improved intake for irrigation water from a silt laden stream. A. L. Harris, diag Eng &

asilt laden stream. A. L. Harris. diag Eng & Contr 42:184-5 Ag 19 '14 Irrigation with fresh water from the sea. E. J. Moynihan. Sci Am S 79:84-5 F 6 '15 Measuring devices for irrigation water tested at the Davis Field laboratory, University of California. diags Eng & Contr 43:248-53 Mr 17 '15

Method and cost of constructing reinforced concrete drops, Canadian Pacific Ry., irriga-tion projects, R. S. Stockton, il Eng & Contr 43:345-6 Ap 14 '15

Irrigation -- Continued

Outline of data to be obtained for a report on the feasibility of any irrigation project. H. F. Robinson. Eng N 72:1315 D 31 '14 Outlook for irrigation construction. F. H. Newell. Eng & Contr 44:151-2 Ag 25 '15 Resolutions of the International irrigation congress. Eng N 72:1161-2 D 10 '14 Structural details and construction costs of a small irrigation system. O. M. Goss. diags Eng & Contr 43:347 Ap 14 '15 Utilizing existing irrigation works to secure useful data. Eng Rec 71:674-5 My 29 '15 Why drainage of irrigated lands is necessary, and how the problem is handled. D. W. Murphy. il Eng Rec 72:36-8 Jl 10 '15; Abstract. Eng M 50:464-5 D '15

See also Dams; Drainage; Irrigation canals; Reclamation of land; Reservoirs; Silt

Cost of electric pumping for irrigation. Elec W 66:68-71 Jl 10 '15; Excerpts. Eng Rec 72: 257-8 Ag 28 '15 Cost of pumping for irrigation. G. E. P. Smith. Eng & Contr 44:148-50 Ag 25 '15 First cost and cost of operation of irrigation pumping plants. H. D. Hanford. Eng & Contr 43:491-2 Je 2 '15

#### Alberta

America's greatest irrigation project; Bassano dam, southern Alberta. Z. E. Black. il Sci Am 113:252-3 S 18 '15

#### California

Concrete headgate, south San Joaquin and Oakdale irrigation district in California. F. C. Scobey, diag Eng & Contr 43:383 Ap

28 '15
Construction methods and costs Sacramento valley irrigation project. P. A. Welty. maps Eng & Contr 43:554-8 Je 23 '15
Dominguez central-station irrigation system.
C. B. Loomis, plan map Eng N 74:540-1 S
16 '15

16 '15 Irrigating the land of little rain. S. M. Kennedy, il diags Elec W 65:1471-4 Je 5 '15 Plan for municipal irrigation from the Los Angeles aqueduct. B. A. Heinly. map Eng N 73:344-6 F 18 '15 Use of water in the Modesto irrigation district. K. A. Heron. Eng N 74:1000-1 N 18 '15

#### Idaho

Cost of electric pumping for irrigation. il map Elec W 66:68-71 Jl 10 '15; Excerpts. Eng Rec 72:257-8 Ag 28 '15 Federal project at Minidoka, Idaho. A. P. Connor. il plans map Power 41:422-5 Mr 30

Increase in operating costs due to pumping, Minidoka irrigation project. Eng & Contr 43: 348 Ap 14 '15

Water power and its relation to irrigation in southern Idaho, J: C. Beebe, il Assn Eng Soc J 54:63-78 F '15

British India, diags U S Sp Cons Rep 72:354-69 '15

Irrigation works of India. H. J. Shepstone. il Sci Am S 80:164-5 S 11 '15

Italy and engineering. Sci Am S 80:11 Jl 3 '15

## Montana

Valier-Montana irrigation project. K. A. Heron. il map plans Eng N 73:241-6 F 11 '15

#### Nebraska

Abandoned irrigation canals and the lesson they teach. Eng & Contr 43:330 Ap 14 '15 Unused irrigation canals. F. H. Newell. Eng N 73:632 Ap 1 '15

Lahontan dam, Truckee-Carson irrigation pro-ject, Nevada. D. W. Cole. il diags map Eng N 73:758-62 Ap 22 '15

### New South Wales

Murrumbidgee irrigation project, il map Engineer 120:321-4 O 1 '15 gineer 120:321-4 O 1

#### Pacific coast

Irrigation pumping in the coast states. il map Elec W 65:1399-1408 My 29 '15

#### Russia

Two large irrigation projects in Russia. M. Nikolitch. il map Eng N 74:8-11, 102-4 Jl 1, 15 '15; Abstract. Eng M 50:457-9 D '15

#### Sudan

Irrigation in the Sudan. Engineer 120:379-80 O 22 '15

#### Texas

Irrigation by pumping at Del Rio, Texas. A. Potter. il diags plan Eng & Contr 43:66-71 Ja 27 '15; Same abr. Eng Rec 71:596-8 My 8

## Turkey

Irrigation works in Mesopotamia. Engineer 120:339 O 8 '15

#### United States

Changed reclamation service again. Eng Rec

Changed reclamation service again. Eng Rec 72:671-2 N 27 '15
Colorado river can supply Imperial valley's needs. Eng Rec 71:788 Je 19 '15
Features of engineering in the West. H. F. Stratton. Sibley J 29:223-5 Ap '15
Progress in irrigation, 1914. F. H. Newell. Eng Rec 71:13-14 Ja 2 '15
Reservoir sites on the Colorado river. L: C. Hill. map Eng Rec 70:670-1 D 19 '14
Shall the irrigation settlers be given relief?
Eng Rec 72:650-1 N 27 '15

Provo reservoir company's irrigation project. C. S. Jarvis. il Eng N 74:394-5 Ag 26 '15

### Washington

Irrigation in the Wenatchee valley. A. Gunn. il Elec W 65:1560-3 Je 12 '15

Irrigation canals

il Elec W 65:1560-3 Je 12 '15

rigation canals

Automatic check gate structure for Turlock irrigation district, California, diags Eng & Contr 43:412 My 5' 15

Bowl outlets reduce velocities at pipeline ends, il diag Eng Rec 72:41 Jl 10' 15

Building concrete drops on irrigation canals in western Canada, R. S. Stockton, il Concrete Cem 6:236-8 My' 15

Concrete chute drops water 130 feet from canal to reservoir, D. W. Cole, il diags Eng Rec 71:456-7 Ap 10' 15

Concrete lining as applied to irrigation canals, S: Fortier, 17 pls U S Agric Bull 126:1-86' '14; Excerpt (Design and structural details), Eng & Contr 43:71-4 Ja 27' 15; Excerpt (Methods and costs of constructing). Eng & Contr 43:130-6 F 10' 15

Concrete lining for irrigation canals at Burbank, Wash, abstracts. E. M. Chandler, Eng N 73:772-3 Ap 22' 15; Eng & Contr 43:489-90 Je 2' 15

Costs of keeping down vegetation on irrigation canal banks by grazing. Eng & Contr 43:347 Ap 14' 15

Earth fill replaces trestle for irrigation canal, il diags Eng Rec 71:525-6 Ap 24' 15

Enlarging an irrigation canal of the Modesto irrigation district, California, K. A. Heron, il diags Eng N 74:486-7 S 9' 15

Gate structures for irrigation canals. Eng & Contr 42:185-6 Ag 19' 14

How to express seepage losses from irrigation canals. S: Fortier, Eng N 73:1128-9 Je 10'

How to express seepage losses from irrigation canals. S: Fortier. Eng N 73:1128-9 Je 10 canals. S: Fortier.

Irrigation weir, measuring rod and discharge card. K. A. Heron. il diag Eng N 74:257 Ag 5 '15

Losses in concrete and mortar lined canals. H. D. Newell. Eng Rec 72:21 Jl 3 '15; Same abr. Eng & Contr 44:22 Jl 7 '15

Methods and costs of lining irrigation canal with Toncan metal. Eng & Contr 43:411-12 My 5 '15

Plaster lining irrigation canals and laterals, Okanogan project, U. S. reclamat on service. C. Casteel. Eng & Contr 43:441-3 Mv 19 '15

Prehistoric irrigation canal in New Mexico. S. M. Johnson, il Eng N 73:561 Mr 25 '15

Irrigation canals -Continued

Recommendations for values of n for different kinds of irrigation channels. F. C. Scobey. Eng & Contr 44:57-60 Jl 21 '15

Eng & Contr 44:57-60 Jl 21 '15 Suggested design of proportional division box for irrigation water, diag Eng & Contr 43: 347-8 Ap 14 '15 Tour of West discloses best practice in irriga-tion and power canal design, C. A. Farwell, Eng Rec 71:623-4 My 15 '15 Transmission losses in Modesto, Cal., irriga-tion canals, K. A. Heron, Eng N 74:583 S 23 '15

Transmission losses in unlined irrigation channels. S: Fortier. Eng N 73:1060-3 Je 3 See also Flumes

Isherwood, Benjamin Franklin, 1822-1915Sketch. por Power 41:903 Je 29 '15; Eng N 74: 44-5 Jl 1 '15

Isobutane

pressures of acetylene, ammonia and Vapor isobutane at temperatures below their normal boiling points. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:2482-6 N '15

Isolated plants, See Electric plants

Isomerism

Isomeric octacetates of lactose. C. S. Hudson and J. M. Johnson, Am Chem Soc J 37:1270-5 My '15

On 1-phenyl-4, 5-dihydro-5-oxy-3-triazolylsul-finic acid and 1-phenyl-4, 5-dihydro-5-oxy-3-triazolylmethylsulfone. E. W. Esslinger and S. F. Acree. Am Chem Soc J 37:183-9 Ja '15

Researches on hydantoins: geometrical isomerism in the hydantoin series. T. B. Johnson and S. E. Hadley. Am Chem Soc J 37:171-7 Ja.

Isoprene

Isoprene from β-pinene. A. W. Schorger and R. Sayre. diag J Ind & Eng Chem 7:924-6 N '15

Isostasy

Isostasy and mountain building. L. de Marchi. Sci Am S 80:198-9 S 25 '15

**Itakolumite** 

Itakolumite, a flexible stone. Sci Am 112:312 Ap 3 '15

Italy

Italy and engineering. Sci Am S 80:11 Jl 3 '15

Army

Italy on a war footing, il Sci Am 112:610-11 Je 19'15

Earthquake, 1915

Real cause of the Italian disaster. Sci Am 112: 94 Ja 30 '15

Military aeronautics

Italian military aeroplanes. J; J, Ide. diags Sci Am S 79:301 My 8 '15

Navy

Italian navy. il Sci Am 112:592-3 Je 12 '15 Renewing of Italy's navy. Sci Am 112:468 My 22 '15

Social conditions

Housing reform in Italy, C. Aronovici. Am Inst Arch J 3:89-93 F '15

Ivory, Vegetable. See Vegetable ivory

Jackhamers Mounted jackhamers. il Colliery 35:452 Mr '15 Jacks

Adjustable jack for emergency service. il Iron Age 95:1289 Je 10 '15

Hydraulic jack for pinion removal. J. G. Koppel. diags Elec Ry J 45:1039 My 29 '15

Jacking out sheetpiles with a friction clamp. diag Eng N 73:1181 Je 17 '15

Large sand jacks work well in lowering 1100-ton span. il Eng Rec 72:304 S 4 '15

Lifting jack with wide range of action. diags Eng & Contr 43:525 Je 9 '15

Simplex pole jack. il Elec R & W Elec'n 67: 683 O 9 '15; Elec W 66:827 O 9 '15 Use and care of lifting jacks. Eng & Contr 43:499-500 Je 2 '15

Jackson, William B.
President of the Western society of engineers.
por Eng & Contr 43:46 Ja 20 '15

Jacksonville, Florida

Water supply

Water works improvements at Jacksonville. il Eng & Contr 44:178 S 8 '15

Wharves

Jacksonville municipal docks nearing completion. Eng N 74:1099 D 2 '15
Novel bulkheads for wharves at Jacksonville,
H. D. Mendenhall, diags map Eng N 74:7724 O 21 '15

Jails. See Prisons

Jamaica, Long Island
Architectural design as an aid to real estate
promotion: principles of group planning applied to small suburban houses. G. H. Irving.
il plans Brickb 23:295-6, pl 191-2 D '14

Jamesonite

La Sirena, a wonderful deposit of Jamesonite. R. W. Raymond. Eng & Min J 99:9-10 Ja 2

Jamestown, New York

Parks

Jamestown's hundred acre lot. S. W. Allen. il Am For 21:567-70 Ap '15

Jamestown, Westfield & Northwestern railroad Electrification. il map Elec Ry J 45:1110-11 Je 12 '15

Japan

Commerce

Is Japan's trade worth while? P. N. Beringer. Am Ind 15:21-2 Mr '15 Japanese markets for American lumber. F. H. Smith. U S Bur For & Dom Com 94:1-16 '15

Industries and resources

Forests of Japan. N. B. Eckbo. il Am For 21: 693-711 Je '15
Hojo coal mine. S. Meguro. il map Colliery 35:575-80, 637-43 Je-Jl '15
Hydroelectric power from snowclad Fujiyama.
C. Tsukamoto. il diag map Elec W 66:910-13

115,000-volt hydroelectric system in Japan. il diags plan Elec W 65:1599-1606, 1671-8 Je 19-26 '15

Japanese

Two false notions concerning the Japanese. R. W. Raymond, Eng & Min J 99:871-2 My 15 '15

Japanning

Crawford sectional ovens in the Ford shops, il Eng M 48:sup2-3 Mr '15
Electrically heated japanning ovens. C. F. Hirshfeld and W. D. Dygert, il Elec W 66: 930-2 O 23 '15

Japanning, its origin and development. M. Rosenberg. il Metal Ind n s 13:58-60 F '15; Same. Metal Work 83:292-3 F 19 '15

Modern acid-dipping, electroplating and japan-ning plant. H. N. Trumbull, il Gen Elec R 18:1121-6 D '15

Radio process japans a car in 3 days. il Automobile 32:278-9+ F 11 '15

Sales arguments for electrically heated japanning ovens. D. Rollins. Elec W 65:43-4 Ja 2 '15

Jefferson, Thomas, 1743-1826 Thomas Jefferson and the first monument of the classical revival in America. F. Kim-ball, il Am Inst Arch J 3:370-81, 421-34, 473-91 S-N '15

Jellutong rubber resin. See Gums and resins Jersey City

Railroads

Industrial development railway for Jersey City. map Elec Ry J 45:663 Ap 3 '15 Reconstruction of the Jersey City terminal yards. il plan Ry Age 58:787-91 Ap 9 '15

Jersey City-Railroads-Continued

rsey City—Rairroads—Continued Track layout and signals of the Jersey City passenger terminal of the Central R. R. of New Jersey, diags plan Ry R 56:647-50 My 15 '15

Jets Liquid jets. C. T. Du Rell. Met & Chem Eng 13:714-16 O 15 '15

Jetties

Vorks for the improvement of navigable estuaries; abstract. L. Luiggi. Eng Rec 72: 637-8 N 20 '15

See also Breakwaters

Jewelry
Dead jewelry stock. O. K. Hillman. Metal Ind
n s 13:8 Ja '15
Model jewelry factory; the Traub manufacturing company, Detroit, Mich. C. M. Hoke, il
Metal Ind n s 13:365-8 S '15; Discussion, 13:
425-6 O '15
Seath American market for jewelry and silvers.

South American market for jewelry and silverware. U S Sp Cons Rep 70:1-23 '15
Treasure of Lahun; beautiful jewelry ornaments and tools found in a plundered pyramid. W. M. F. Petrie. il Sci Am S 79:264-5 Ap 24 '15

See also Precious stones

Jiggers. See Chiggers

Armature bearing jig. W. E. Nees. il Elec Ry J 46:324 Ag 21 '15

Jig a Mr and fixture design. diags Mach 21:580-1

Mr '15 Jig and fixture mechanisms. G; M. Meyncke. diags Mach 21:970-4 Ag '15 Jigs and jig making. M. R. Lawrence. il Engi-neer 118:588-90 D 18 '14 Providing for up-keep in designing jigs and fixtures. A. A. Dowd. diags Mach 22:12-15 S

Special jigs for locomotive repair shops, il diags Ry Age (Mech ed) 89:409-12 Ag '15 Standard jig fastening. C: C. Anthony, diags Mach 22:31 S '15

Two useful drill jigs. il Mach 21:278 D '14

Jigs (ore treatment) Neill jigging apparatus. diag Eng & Min J 100: 313 Ag 21'15

Jitney buses

Ammunition in the jitney war. Elec Ry J 45: 634 Mr 27 '15
Cost of bus operation. il Elec Ry J 45:414-17 F 27 '15
Dangers of the jitney. S. M. Williams. Elec Ry J 46:364 Ag 28 '15
Developments in California and Washington. Elec Ry J 45:256-8 Ja 30 '15
Developments in Los Angeles, in Texas cities, in San Francisco and in Portland. Elec Ry J 45:204 Ja 23 '15
Developments in the jitney bus field. Automo-

45:204 Ja 23 '15
Developments in the jitney bus field. Automobile 32:650-1, 693-4 Ap 8-15 '15
Economics of the jitney bus movement. F. W. Doolittle. Elec Ry J 46:20-4 Ag 7 '15
Economics of the jitney problem from a traction company's viewpoint. C. N. Black. Elec Ry J 46:510-11 S 18 '15
Effect of publicity on the jitney movement in Portland. F. W. Hild. Elec Ry J 46:560-1 S 18 '15

Portland. F. W. Hild. Elec Ry J 46:560-1 S
Human element determines success or failure of jitney movement. Automobile 32:6667 Ap 15 '15
Information summarized from fourteen cities.
Elec Ry J 45:648-50 Mr 27 '15
Jitney and the small car. H. S. Cooper. Elec
Ry J 46:64-5 J1 10 '15
Jitney bus competition. J. E. Hewes. Elec Ry
J 46:18-19 J1 3 '15
Jitney bus; cost of operation, etc.; abstracts.
C. I. Palm. Elec Ry J 45:795-6 Ap 24 '15;
Eng N 73:934-5 My 13 '15
Jitney bus, impossibility of an ultimate economic success. Eng M 49:116-18 Ap '15
Jitney bus in Los Angeles, E. L. Lewis. Elec
Ry J 45:757-8 Ap 17 '15
Jitney bus invasion. Eng Rec 71:221 F 20 '15
Jitney bus invasion. Eng Rec 71:221 F 20 '15
Jitney bus on the wane in Memphis, Tenn.
Elec Ry J 46:395 S 4 '15
Jitney bus strong in many Ohio cities. Horseless Age 35:272 F 24 '15

Jitney bus vs. the trolley car. Eng N 73:946- $^7$  My 13  $^{'15}$  Jitney buses. Ry R 56:155-6 Ja 30  $^{'15}$  Jitney buses appear in western Canada.

Jitney buses Ry R 56:155-6 Ja 30 '15
Jitney buses appear in western Canada.
Horseless Age 35:342 Mr 10 '15
Jitney convention, Kansas City, May 4-6, Elec
Ry J 45:960 My 15 '15
Jitney down East. Elec Ry J 45:861-2 My 1 '15
Jitney figures from two southern cities. Elec
Ry J 45:1021-2 My 29 '15
Jitney from the community standpoint. Ry R
56:666-7 My 15 '15
Jitney—its wane and possible influence on
urban transportation. Eng Rec 71:513 Ap 24
'15

Jitney movement reaches eastern cities. Automobile 32:434-5 Mr 4 '15
Jitney operation in Dallas, Tex.; number of cars in operation and average earnings per car. Elec Ry J 45:884 My 8 '15
Jitney problem. J. C. Thirlwall. Sci Am S 80: 143-4, 154-5 Ag 28-5 4 '15; Same. Gen Elec R 18:604-14 Jl '15
Jitney problem in Philadelphia. Elec Ry J 45: 1224-5 Je 26 '15
Jitney seen as a picturesque industry defying laws of investment and production. Elec Ry J 46:251-2 Ag 7 '15
Jitney situation. J. H. Wilson. Elec Ry J 45:

J 46:251-2 Ag 7 15 Jitney situation. J. H. Wilson. Elec Ry J 45: 421-2 F 27 15 Jitney statistics at Fort Worth. Elec Ry J 46:54 J 1 10 15 Jitney vs. light cars. Elec Ry J 45:1206-9 Je Jitney v

Jitney vs. the trolley. F. D. Everett. Elec Ry J 46:151 Jl 24 '15 Jitneys at San Antonio. Elec Ry J 45:1197 Je

Jitneys carry 45,000 daily in Kansas City. Automobile 32:346 F 18 '15 National jitney convention to be held in Kansas City in May. Elec Ry J 45:650 Mr 27

New jitney buses; Studebaker, Koehler and Kissel special vehicles of this type. il Automobile 32:562 Mr 25 '15
Portland company on jitney bus. Elec Ry J 45:396-7 F 20 '15
Railway and jitney nickels; their distribution. Elec Ry J 45:1024 My 29 '15
Report on motor vehicles. Elec Ry J 45:619-24 Mr 27 '15
Rise and decline of the jitney in its birthele.

Rise and decline of the jitney in its birthplace. E. L. Lewis, il Elec Ry J 46:500-2 S 18 '15 South Bend collects jitney data. Elec Ry J 46:399 S 4 '15

46:399 S 4 Studebaker jitney bus. il Horseless Age 35:410 Mr 24 '15

Mr 24 '15 Thirty-nine cities have been invaded. Elec Ry J 45:309-10 F 6 '15

Regulation

Application of established legal principles the jitney, W. E. Dunn, Elec Ry J 46:50 S 18 '15

Buffalo, Portland, El Paso and Tucson have passed ordinances. Elec Ry J 45:774-6 Ap 17

California supreme court upholds San Fran-cisco ordinance ruling—Georgia commission's plan for regulation. Elec Ry J 46:125 Jl 17

ities and legislatures striving for adequate regulatory measures. Elec Ry J 45:530-2 Mr 13 '15

City and state legislative progress. Elec Ry J 45:908-10 My 8 '15 Commission rulings. Elec Ry J 45:1092-3 Je 5

Developments in the jitney bus field. Automo-bile 32:739 Ap 22 '15

bile 32:739 Ap 22 '15
Digest of jitney ordinances. C. L. King. Elec
Ry J 46:314-17 Ag 21 '15

Effective jitney ordinance. Elec Ry J 45:397-8 F 20 '15

8 F 20 '15
Efforts toward regulatory legislation—labor's attitude in Rock Island and Providence. Elec Ry J 45:602-4 Mr 20 '15
First jitney case before New York public service commission. Elec Ry J 46:929-30 O 30 '15
Further action before the public service commission of New York—the Philadelphia injunction suits. Elec Ry J 46:650 S 25 '15
Hearing on bus regulations in Los Angeles—San Diego company outlines its position. Elec Ry J 45:156 Ja 16 '15

Jitney buses—Regulation—Continued
Houston and Salt Lake City regulatory ordinances passed—San Francisco ordinance introduced. Elec Ry J 45:733-4 Ap 10 '15
Jitney a public utility. Automobile 32:1053 Je 10 '15

10 '15
Jitney as state and city issues. Elec Ry J 46:
1057-8 N 20 '15
Jitney common carrier in Wisconsin. Automobile 33:399 Ag 26 '15
Jitney conditions in St. Louis—the Fort Worth ordinance sustained—jitney ordinances in Augusta, Birmingham and Providence. Elec Ry J 45:1005-6 My 22 '15
Jitney jottings. Elec Ry J 46:690, 845, 970 O 2,
16, N 6 '15
Jitney omnibus legislation: analysis of regulations.

Jitney omnibus legislation; analysis of regulations in eleven cities. A. L. Bostwick. Munic J 38:591-2 Ap 29 '15 Jitney ordinances recently passed. Elec Ry J 46:207 Jl 31 '15

Jitneys regulated. Automobile 32:963-4 My 27

Letter from New York commission to may or and district attorneys on jitney status. Elec Ry J 46:781-2 O 9 '15 Los Angeles jitneys declining. Elec Ry J 46:206 JI 31 '15

Massachusetts bill to regulate jitney bus. Elec Ry J 45:258 Ja 30 '15 New problem in traffic regulation. F. Reed. il Munic Eng 48:160-7 Mr '15 New York and California commissions have

New

jitney regulatory problems before them. Elec Ry J 46:292-3 Ag 14 '15 ew York state bill signed—jitney made a commission issue in Illinois. Elec Ry J 45: rowmission issue in Illinois. Elec Ry J 45: 1048 My 29 '15
Ordinance in Newark before mayor; Progress of regulation in other cities. Elec Ry J 46: 467-8 S 11 '15
Ordinances passed in St. Louis and Lorange

467-8 S 11 '15 Ordinances passed in St. Louis and Logan-sport. Elec Ry J 46:1098 N 27 '15 Progress of legislation—state and city meas-ures pending. Elec Ry J 45:691-2 Ap 3 '15 Proposed jitney regulation in Rhode Island. Horseless Age 35:409 Mr 24 '15 Public service commission and court action in New York on jitney. Elec Ry J 46:377-8 Ag 92 '15

28 '15 Public service commission of Maryland prescribes rules for jitney operation. Elec Ry J 45:1226 Je 26 '15
Public service commission of the District of Columbia decides buses are common carriers. Elec Ry J 46:421-2 S 4 '15
Railroad commission of California has no jurisdiction over motor bus—first jitney application passed upon by New York commission. Elec Ry J 46:88 O 23 '15
Regulation for the jitney bus. Elec Ry J 45: 374-7 F 20 '15
Regulation of jitney busses in St. Louis. Munic Eng 48:341-2 Je '15
Regulatory measures, Elec Ry J 46:82-3 Jl 10 '15

Regulatory ordinances. Elec Ry J 45:1133-5; 46:39-40 Je 12, Jl 3 '15
San Francisco, Atlanta, Fargo, Gadsden, Spokane and Little Rock pass regulatory measures—state bills—the jitney convention. Elec Ry J 45:817-18 Ap 24 '15
San Francisco jitney men and city authorities in complete accord. Automobile 32:873-4 My 13 '15

Summary of recent significant developments covering various phases of the problem. Elec Ry J 45:957-8 My 15 '15 Terms of new Springfield and Portland regu-

latory ordinances: Georgia jitney ruling. Elec Ry J 45:1182-3 Je 19 '15 Travels with the jitney. Elec Ry J 46:166-7 Jl 24 '15

Trend of recent legislation. Elec Ry J 45:484-6 Mr 6 '15 Wisconsin jitney law. Elec Ry J 46:378 Ag 28

Jobbers Winning the co-operation of the jobber. Metal Work 83:38 Ja 1 '15 Jobwork. See Typesetting—Jobwork

Johns Hopkins university Gilman hall and Mechanical and electrical en-gineering building; views and plans. Brickb 24:pl 136-43 O '15

New home of Johns Hopkins university, J: M. Hammond, il Arch Rec 37:481-92 Je '15

New Johns Hopkins buildings dedicated. Power 41:761-2 Je 1 '15

Joint committee on classification of technical literature

Organization. Munic J 38:783-4 Je 3 '15; Same cond. Eng Rec 71:696 My 29 '15; Same cond. Elec W 65:1434 My 29 '15

Joints

Behavior of riveted joints under stresses: abstracts. J. E. Howard. Int Marine Eng 20:18-19 Ja '15; Power 41:216 F 9 '15 Cooper universal joint. il Mach 22:67-8 S '15

Diagonal joints. T: Grimes; R. D. Irvington. Power 41:485-6 Ap 6 '15

Flexible leather shaft couplings replace metal-lic type. diags Automobile 32:272-3 F 11 '15

Friction losses in the universal joint: abstracts. P. F. Walker and W. J. Malcolmson. Iron Age 94:1438-9 D 24 '14; Am Soc M E J 37:17-20 Ja '15; Automobile 32:378-9 F 25 '15

Methods of jointing aluminum, il Mach 21:470-

Two types of joint between walls and bottom of a reservoir. diags Eng N 73:591 Mr 25 '15

Universal joint efficiency. C. W. Spicer. Horseless Age 35:74 Ja 13 '15

See also Boilers-Joints; Couplings; Pipe joints; Rail joints

Journalism

Science in the daily press. R. A. Gregory. Illum Engr 8:203-7 My '15 See also Newspapers; Publicity

Journals (machinery). See Bearings

Juggling. See Conjuring Juniper

Cypress and juniper trees on the Rocky mountain region. G: B. Sudworth. 26 pls 11 maps U S Agric Bul 207:1-36 '15

Junkers engines Junkers oil engine. F. E. Junge. diags Eng M 48:689-93 F '15

Jupiter (collier)

Performance of the electrically propelled collier Jupiter. S. M. Robinson. Eng N 73:393
F 25 '15

Finishing jute twine, diag Textile World 48: 431-2 Ja '15

# K

Kalamazoo, Michigan

Lighting

Kalamazoo municipal plant. T: Wilson, il plans Power 41:218-24 F 16 '15 Kalamazoo situation. W: Newbigging. Am Gas Light J 103:38-9 JI 19 '15

Kaleidoscope

Photo-kaleidograph, il Sci Am 112:103 Ja 30 '15 Photokaleidograph: an apparatus for the pro-duction of kaleidoscopic pictures. il Sci Am S 79:12-13 Ja 2 '15

Kambara earth Kambara earth and its bleaching action on oils. S. Ueno. diags J Ind & Eng Chem 7:596-600 Jl '15

Kansas

Sanitary affairs

State control of water-supply and sewerage in Kansas. Eng N 73:209 F 4 '15

Kansas City, Kansas

Bridges

Design features of the East Kansas avenue bridge over the Kansas river at Kansas City. diags Eng & Contr 43:496-9 Je 2 '15

Public works

Municipal water and light plant of Kansas City. P. W. Morgan, il Munic Eng 48:284-5 My '15

### Kansas City, Missouri

Bridges

Construction of the Twelfth street trafficway

Construction of the Twelfth street trafficway viaduct. E. E. Howard. diags plan Eng & Contr 44:328-32 O 27 '15
Half-mile concrete viaduct provides doubledeck trafficway in Kansas City. H. H. Fox. il diags Eng Rec 71:164-6 F 6 '15
Methods and equipment used in erecting girder spans of Pennsylvania avenue viaduct, Kansas City. W: F. Wynne. il plan Eng & Contr 43:539-40 Je 16 '15
New double-deck bridge over the Missouri river at Kansas City. diag map Ry Age 59: 284 Ag 13 '15
Twelfth street double-deck viaduct at Kansas City. il diags Eng N 73:10-15 Ja 7 '15

Railroads

Kansas City terminal power plant, il Elec W 65:1468-70 Je 5 '15 Union passenger station, il Arch & Bldg 47: 226-9+ Je '15

Viaduct construction on the Kansas City ter-minal, A. R. Eitzen, il diag Ry Age 58:397-400 Mr 5 '15

Kansas City railway & light company
Kansas City supplemental plan, Elec Ry J
46:1054-5 N 20 '15

Kansas City Southern railway Financial statistics, map Ry Age 59:724 O 22

Kansas gas, water, electric light & street railway association
18th annual convention, Topeka, Oct. 21. Elec
R & W Elec'n 67:809 O 30 '15

Kaolin

aolin
Kaolin in the treatment of bacteria carriers.
Sci Am S 80:151 S 4 '15
Origin of kaolin, W. Lindgren. Econ Geol 10;
89-93 Ja '15
White-burning clays of the southern Appalachian states. J. H. Watkins. il map Am Inst
Min E Bul 98:391-411 F '15; Abstract. Met
& Chem Eng 13:179-80 Mr '15

Katathermometers Measure of comfort in factories. J. A. Seager. il Heat & Ven 12:24-7 S '15

Kathode rays. See Cathode rays

Kavala

Kavala, the the debatable land. Sci Am S 80:312-

Keefer, Thomas C. Late Thomas C. Keefer and the plans for the Victoria bridge at Montreal. Eng N 73:179-80 Ja 28 '15

Kelp

Business aspect of the kelp proposition. F: P. Dewey. Sci Am S 79:71 Ja 30 '15 Destructive distillation of Pacific coast kelps. D. R. Hoagland. J Ind & Eng Chem 7:673-4 D. R.

Pacific kelp beds. Sci Am 112:457 My 15 '15 Scottish kelp industry. Met & Chem Eng 13: 443 Jl '15

Kelvin, William Thomson, 1st baron, 1824-1907 Lord Kelvin's work on gyrostatics; with discussion. A. Gray. il Inst E E J 53:277-307 F 15 '15

Kenotron

enotron
New device for rectifying high tension alternating currents. S. Dushman. diags Gen
Elec R 18:156-67 Mr '15; Abstract. Elec W
65:659-60 Mr 13 '15
Pure electron discharge and its applications in
radio telegraphy and telephony. I. Langmuir.
diags Gen Elec R 18:332-4 My '15

Kensico dam

Architecture of Kensico dam. A. D. Flinn. il diag Eng N 74:433-6 S 2 '15 Electrically operated contractor's plant for

building Kensico dam. A. W. Carroll, il Eng Rec 71:18-20 Ja 2 '15

Kensico dam construction in 1914. W. Smith. il plan Eng N 73:966-8 My 20 '15

Thermophones in Kensico dam. W. F. Smith. diags Eng N 72:1172 D 10 '14

Yardage record at Kensico dam due, in part, to operation of mixers. G: T. Seabury. Eng Rec 71:199 F 13 '15

## Kentucky

Industries and resources

Advantages of the western Kentucky field. F. V. Ruckman. Colliery 35:488-9 Ap 15 Oil and gas possibilities of Kentucky. F. J. Fohs. map Am Inst Min E Bul 99:621-8 Mr

Kentucky mining institute
Winter meeting in Louisville, Dec. 4-5, 1914.
Colliery 35:328-30 Ja '15

Keokuk, Iowa
Mitering lock gate at Keokuk presents novel features. B. H. Parsons. il diags Eng Rec 72:344-9 S 18 '15
Submersible lock gate at Keokuk operated by compressed air. B. H. Parsons. il diags Eng Rec 72:446-50 O 9 '15

Bridges

Reconstruction of Mississippi river bridge at Keokuk, diag Eng N 74:260-2 Ag 5 '15

Extinguishing fire with kerosene. Sci Am S 80:115 Ag 21 '15
Preparation of gasoline and kerosene from heavier hydrocarbons. B: T. Brooks and others, diags J Ind & Eng Chem 7:180-5 Mr

Kerosene engines. See Gas and oil engines Kerosene lamps. See Lamps

Ketchup

Determination of formic acid in ketchup. C. A. Peters and L. P. Howard. J Ind & Eng Chem 7:35-7 Ja '15

Ketones

Addition compounds of aldehydes and ketones with organic acids. J. Kendall and W. A. Gibbons. Am Chem Soc J 37:149-62 Ja '15 Method for the separation and identification of certain homologous a-diketones. J. M. Johlin. Am Chem Soc J 37:892-6 Ap '15

Keyseating machines

Burr portable shaft keyseater, il Mach 21:505-6 F '15; Iron Age 95:185 Ja 21 '15 Khaki

Dyeing of military khaki. Textile World 48: 424-5 Ja '15

Kiaochow Problem in war names. Sci Am 111:486 D 12 '14

Kiel; its naval and engineering features. A. W. Metcalfe, diags Engineer 120:50-2 Jl 16 '15; Same cond. Sci Am S 80:234 O 9 '15

Kilauea

Diary of Kilauea. il Sci Am S 79:36 Ja 16 '15 otes from a volcano laboratory; personal documents in the case of Kilauea and Mauna Loa. T. A. Jaggar, jr. il Sci Am S 80:214-17 Loa. T. O 2 '15

Flue dust sintering plant at Gary, Ind. il plan Flue dust sintering plant at Gary, Ind. il plan Flue Age 95:1168-70 My 27 '15 Kilns for lime burning. Sci Am S 80:7 Jl 3 '15 Norfolk & Western humidity-controlled dry kiln for lumber. W. H. Lewis. il plans Ry Age (Mech ed) 89:462-4 S '15; Same. Ry Age 59:431-3 S 3 '15 Potary kilns for desulphurization and agglom-

59:431-3 S 3 '15 Rotary kilns for desulphurization and agglomeration. S: E. Doak. Am Inst Min E Bul 105:2061-6 S '15; Same. Iron Age 96:574-6 S 9 '15; Same. Iron Tr R 57:1178-9+ D 16 '15; Same cond. Eng & Min J 100:601-2 O 9 '15 Rotary sintering kilns at Gary. H. C. Estep. il diag Iron Tr R 56:1020-2 My 20 '15

Kilowatt

Relation of the horse-power to the kilowatt. Sci Am S 79:162-3 Mr 13 '15

Kindergartens

Downers Grove kindergarten, Downers Grove, Ill.; views. Brickb 24:pl 103-5 Jl '15 Modern schoolhouse: the kindergarten. il plans

Brickb 24:8 Ja '15 Kinematics. See Force and energy

Kinetic theory of gases. See Gases, Kinetic theory of

Kitchen cars

All-steel kitchen car, North-Eastern railway, il plan (supp) Engineer 119:480, 482 My 14

Kitchen cars—Continued
British all-steel kitchen cars, il diags Ry Age
(Mech ed) 89:178-82 Ap '15

Kitchens

Doing it electrically at West Point, J; A. Randolph, il Elec W 66:574-5 S 11 '15
Gas kitchen equipment of the Biltmore hotel.
C. F. Herington, il plan Am Gas Light J 102:170-2 Mr 15 '15
Illinois chapter discusses kitchen ventilation. Metal Work 83:171 Ja 22 '15
Kitchen ventilation for a modern hotel; equipment of the Biltmore New York il disce

ment of the Biltmore, New York. il diags plan Heat & Ven 12:13-18 Ja '15 Large electric kitchen; abstract. K. Perlewitz. diag Elec W 64:1115-16 D 5 '14

See also Kitchen cars

Kjeldahl flask

Modified kjeldahl flask for determining soil nitrogen, H. A. Noyes, il Am Chem Soc J 36:2541-2 D'14

Klamath mountains, California Pocket deposits of the Klamath mountains, California, H: G. Ferguson, il maps Econ Geol 10:241-61 Ap '15

Knit goods

Bias knitted fabric. diag Textile World 48:444 Ja '15

Bleaching knit goods. Textile World 48:409 Ja

Calculating the cost of knit goods. Textile World 50:218-24 N '15 Canadian knit-goods market and how it is Canadian knit-goods market and how it is supplied. E. S. Bates. Textile World 49:sup 271-2 My '15
Causes of cloudy work in worsted knit goods. il Textile World 49:671-3 S '15
Defects in knit goods. Textile World 48:519-21

Fancy knit goods for ladies' goods, il Textile World 48:233-5, 343-4 N-D'14 Finishing knit underwear. Textile World 49: 449-50; 50:103-4 Jl, O'15 Flat and balbriggan knit goods. Textile World 49:546-7 Ag'15 Fleece-lined fabric. diag Textile World 48:423

Ja '15
Fleeced lined knit goods. Textile World 48: 616-17 Mr '15
Improved knit fabric. il Textile World 49:540-1

Mill wrinkles in knit goods. Textile World 48: 323-6 D '14

New flat seaming machine for knitted goods, il Textile World 48:513-15 F '15 Novel knitted fabric, diags Textile World 48: 609-10 Mr '15

Stripes in knit goods. il Textile World 50:106-7

Twisted-net fabric, il Textile World 49:645-7 S'15

See also Hosiery

Knitting Fancy knitting, il Textile World 48:611-13 Mr

Kinks in knitting, diags Textile World 49:109-11 Ap '15 Knitting silk plated coats. Textile World 49: 361 Je '15

Knitting machinery

Circular knitting machine, diags Textile World 48:420-1, 614-15 Ja, Mr '15 Hand knitting machine, diags Textile World 48:351-3 D '14

Improved circular knitting machine. Textile World 49:454-6 Jl '15

Improved pearl stitch knitting machine. il Textile World 49:691-2 S '15

Knitting machine needle. diags Textile World 48:518-19; 49:105-7 F, Ap '15
Latch opening mechanism for knitting machines. diags Textile World 49:452-3 Jl '15

Needle carrier for knitting machines. diags Textile World 48:416-17 Ja '15

Philadelphia knitting machinery exhibition, il Textile World 49:245-270b My '15

Speed of knitting machines on neckwear. Tex-tile World 49:453-4 Jl '15

Tuttle knitting machine, il Textile World 48: 342 D'14

Knitting mills

Design and construction of the Gantner-Mattern co. knitting mill at San Francisco. E. F. Cykler. il diags Concrete Cem 6:273-7 Je '15

Knives

See also Cutlery

Knots and splices Manila rope fastenings, il Eng Rec 70:706 D 26

Tests of splices in galvanized iron wire. T. Croft, il Elec R & W Elec'n 67:716-17 O 16 '15

Kongo. Belgian

tral Africa. S. H. Ball and M. K. Shaler. il map Econ Geol 9:605-63 O '14; Excerpts. Eng & Min J 99:441, 608-11 Mr 6, Ap 3 '15 Katanga increasing its output. R. Williams. Eng & Min J 100:308 Ag 21 '15

Koppat

ew waterproof resistance material. il Elec R & W Elec'n 66:402 F 27 '15

Kubisagari

Drop head, a new ailment. L. K. Hirshberg. Sci Am 112:67 Ja 16 '15

Kynuna wells

Kynuna wells—a test case of rock pressure, J. W. Gregory, map Econ Geol 9:768-75 D'14

Labels

Outgrowths of letterpress. G: Sherman. Inland Ptr 54:777-80; 55:42-7 Mr-Ap '15

Package labels. Inland Ptr 56:208a-208h N '15 Labor and capital

or and capital ew certificate of character for manufac-turers, R. G. Valentine, Ind Eng 15:40-3 F

Scientific management and the labor problem. R. T. Kent. Ind Eng 14:418-21 N '14

See also Arbitration, Industrial; Boycott; Employees; Employers' associations; Indus-trial betterment; Labor and laboring classes; Profit sharing; Strikes; Trade unions; Wages; Welfare work in industry

Labor and laboring classes
Art through the emancipation of the workman. R. A. Cram. Am Inst Arch J 3:242-3
Je '15

Guggenheim's testimony to United

Daniel Guggenheim's testimony to United States industrial relations commission. Eng & Min J 99:245-7 Ja 30 '15
Influence on architecture of the condition of the worker, by T: S. Attlee, Review by F: L. Ackerman. Am Inst Arch J 2:547-55 D '14
Labor problems in scientific management. Iron Age 94:1369-72 D 10 '14

ge 31.1603 and Sec also Apprentices; Arbitration, Indus-ial; Bonus system; Convict labor; Effi-ency Industrial; Employees; Government trial; Bonus system; Convict labor; Efficiency, Industrial; Employees; Government employees; Hours of labor; Housing problem; Industrial betterment; Industrial education; Labor and capital; Labor exchanges; Labor laws; Miners; Open and closed shop; Profit sharing; Railroads—Employees; Scientific management; Strikes; Trade unions; Unemployed; Wages; Welfare work in industry; Workmen's compensation

Labor camps. See Construction camps

Labor exchanges
Country-wide employment bureau under federal direction. Eng & Contr 43:437 My 19 '15
Department of labor to find workmen for manufacturers. Iron Age 95:223 Ja 21 '15
Proposed National labor bureau. Iron Age 95: 253-4 Ja 28 '15

Labor laws
Alien labor law declared unconstitutional, Eng
Rec 71:61 Ja 9 '15

See also Factory laws; Foundry laws; Hours of labor; Minimum wage; Mining laws; Picketing; Workmen's compensation

Laboratories

Description of the new building of the Mellon institute, W. A. Hamor, il plans J Ind & Eng Chem 7:333-43 Ap '15

Laboratories -Continued
Laboratory's the thing for the United States army and navy. Sci Am 113:90 Jl 31 '15
New laboratory plans of the Massachusetts institute of technology. plans Eng N 74:340-1 Ag 19 '15
Pennsylvania railroad test department, C. D. Young, il plan Ry Age (Mech ed) 89:332-7 Jl '15; Same. Ry Age 59:6-11 Jl 2 '15; Same. Ry R 57:2-5, 42-6, 117-18 Jl 3-10, 24 '15; Excerpts. Metal Ind n s 13:288-9 Jl '15

See also Moving picture laboratories; Waterworks—Laboratories

Laboratories, Electric. See Electric laboratories Laboratories, Engineering. See Engineering laboratories

Laboratories, Mining. See Mining laboratories Laboratories, Municipal. See Municipal labora-

Laboratories, Physical. See Physical labora-

Laboratories, Physiological. See Physiological laboratories

Lac insect

Curious insect that is the source of lac var-nishes, il Sci Am S 80:281-2 O 30 '15

Finishing of knit underwear, il Textile World 49:541-4 Ag '15 49:541-4 Ag '15 Improved lace fabric, il Textile World 48:315-

16 D '14

Lace curtains
Finishing Nottingham lace curtains. Textile
World 49:552-3 Ag '15

Lackawanna steel company Report for 1914. Iron Tr R 56:528-9 Mr 11 '15

Lacolle Junction, Quebec

Bridges

Design, construction and detailed costs of the Richelieu river bridge. il diags Eng & Contr 42:542-6, 585-9 D 9, 23 '14

Lacquer

See also Japanning

Lactic acid

Better bread by means of natural lactic acid. A. Wahl. J Ind & Eng Chem 7:773-5 S '15

Lactones

actones Esters, as well as the monomolecular  $\beta$ - and  $\gamma$ -lactones, of d-mannonic and d-gluconic acids; on ortho-bis-d-galactonic acid, d-galactonic  $\gamma$ -lactone and its mono-hydrate. O. F. Hedenburg. Am Chem Soc J 37:345-72

Lactose octacetate

Isomeric octacetates of lactose. C. S. Hudson and J. M. Johnson. Am Chem Soc J 37:1270-5 My '15

Ladders

Capital mine steel ladders. E: S. Wiard. diag Eng & Min J 99:944-5 My 29 '15 Safeguarding of ladders, stairs and platforms. il diags Am Ind 15:supl-4 F '15 Wood vs. steel mine ladders. G: E. Collins. diag Eng & Min J 100:186 Jl 31 '15

Lagan

Logging Rasak and Lagan. T. R. Helms. il Am For 21:1050-3 N '15

Lake Erie & Eastern railroad
Engineering features involved in building the
Lake Erie & Eastern R. R. through the city
of Youngstown. il plan map Ry R 57:132-7
Jl 31 '15

Lake Erie and Ohio river canal

reposed Lake Erie and Ohio river canal; with discussion. G. F. Stickney. map Eng Soc W Pa 31:285-33 My '15

Lake Shore & Michigan Southern railway Annual report for 1914. Ry Age 58:724-6 Mr 26 '15

New York Central and the Lake Shore: revenue for 1914. Ry Age 58:683-5 Mr 26 '15

Lake Superior mining institute 20th annual meeting. Eng & Min J 100:446-7 S 11 '15 20th annual meeting. Iron Tr R 57:542-5 S 16

20th annual meeting, Sept. 6-9. Iron Age 96: 636-7 S 16 '15

Lakeland, Florida

Politics and government

Commission government and an engineer manager for Lakeland. H. D. Mendenhall. Munic Eng 48:249-51 Ap '15

Year of commission-manager government at Lakeland, Fla. D. F. McLeod. Eng N 72:1118 D 3 '14

Lakeside press

Training the apprentice. H. Hillman. il Inland Ptr 55:820-2 S '15

Lambert

nits of brightness, J. R. Cravath, Elec W 66:60-1 Jl 10 '15

Lamme, Benjamin G. Sketch. por Eng M 50:207 N '15

Lamp posts

How concrete lamp-posts are made for Lincoln park, Chicago. G: T. Donoghue. il diag Eng N 74:989 N 18 '15

Shock-absorbing east iron lamp post, il diags Ry Age 58:464 Mr 12 '15

See also Street lighting fixtures

Lamps

Explosion of kerosene lamps. Sci Am S 79:92  $\mathrm{F}$  6 '15

Grading and marking of lamps, Illum Engr 8: 149-51, 162 Ap '15

Making lamps for Christmas presents, W: Neubecker, il diags Metal Work 82:770-1 D 11 '14

Measurements for the household, diags U S Bur Stand Circ 55:68-81 '15

Tools for making lamp wick-tubes and burner caps. R. Toeplitz. il diags Mach 21:1002-3 Ag

also Electric lamps; Gas lamps; Headlights; Reflectors; Safety lamps; Searchlights

Lampyridae Experiments on the nature of the photogenic processes in the lampyridae. F. A. McDer-mott. Am Chem Soc J 37:401-4 F '15

When is land used for common carrier purposes? Eng Rec 71:424 Ap 3 '15

See also Clearing of land; Coal lands; Mineral lands; Railroad land; Real estate; Reclamation of land; Surveying

Land clearing. See Clearing of land

Land grants

State and public grants. J. W. Thor U S Bur Mines Bul 94:pt 2, 1239-1307

Land laws

United States mining statutes annotated; set-tlers' relief acts. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 1215-34 '15

Landlord and tenant
Damage to stock from leaky rented building,
E. J. Buckley. Metal Work 83:399 Mr 12 '15

Landscape gardening Principles of landscape forestry. W. Miller. il Am For 21:969-76 O '15

Recent aspects of garden design. H. D. Eberlein. il Arch Rec 37:300-19 Ap '15

Landslides

Extensive earth slippage shuts down cement plant. il plan Eng N 74:330-2 Ag 12 '15

Landslide on the Kanawha & Michigan Ry. il Eng N 73:747 Ap 15 '15

Sinking land wrecks cement company's power plant, il Eng Rec 72:179-80 Ag 7 '15 Stopping a landslide at Mount Vernon, N. H. Darton, il Eng N 73:369-70 F 25 '15

Water-soaked bed of blue clay caused land-slip at cement plant near Hudson, N. Y. slip at cement plant near Hudson, N. Y. D. H. Newland. map Eng Rec 72:253-4 Ag 28 '15

See also Earthwork-Slides; Panama canal -Slides

Langmuir, Irving
William H. Nichols medal award, por J Ind
& Eng Chem 7:348-9 Ap '15

Language. See English language; Phonetics; Punctuation

#### Langwies, Switzerland

Bridges

Design and construction of the Langwies viaduct—Chur-Arosa R. R. A. M. Wolfe. diags Concrete Cem 6:239-45 My '15

Lanterns, Electric. See Electric lanterns

Lap windings. See Armatures

Lapping. See Grinding and polishing

Manufacture of ethyl alcohol from wood waste; western larch as a raw material. F. W. Kressmann. J Ind & Eng Chem 7:922-3 N '15

Cooking fats in South America, U S Sp Cons Rep 67:1-15 '15

Lassen Peak

Mt. Lassen eruption. R: H. Boerker. il Am For 21:51-5 Ja '15 Volcanic activity of Mt. Lassen. T: H. Means. il Eng N 73:1210-11 Je 24 '15

Converting an engine lathe into a semi-automatic machine. il diags Mach 21:534-5 Mr

ouble spindle polishing lathes, il Metal Ind n s 13:432 O '15Double

Double spindle poishing lathes, il Metal Ind n s 13:432 O '15
Driving wheel lathe, il Ry Age (Mech ed) 89: 371-2 Jl '15
Engine lathe for heavy reduction work, il Iron Tr R 57:268-9 Ag 5 '15
Engine lathe for machining projectiles, il Iron Tr R 57:5 Jl 1 '15
Fairbanks-Morse manufacturing lathe, il Mach 21:1023-4 Ag '15
14-in, heavy automatic shrapnel lathe, il Iron Age 95:454 F 25 '15
Gear guard for lathes, S, K, Eastwood, diag Iron Age 95:948 Ap 29 '15
Hardinge precision lathe with quick change of swing, il Mach 21:323-4 D '14
Heavy single operation shell lathe, il Iron Age 96:82 Jl 8 '15
High-speed turret lathe, il diags plate (supp) Engineer 120:184-5 Ag 20 '15
Lathe for plain turning, il Iron Tr R 57:264 Ag 5 '15
Mammoth driving wheel lathe, il Sci Am S 80:

Mammoth driving wheel lathe, il Sci Am S 80: 129 Ag 28 '15

Motor-driven gun boring lathe, il Iron Age 94: 1486 D 31 '14

Niles-Bement-Pond projectile lathes, il Mach 21:926-8 Jl '15

100-in, driving wheel lathe, il Iron Age 95: 1004-5 My 6 '15

Redesigned 24-in, turret lathe, il Iron Age 96: 309 Ag 5 '15

Shell-case turning lathe with pneumatically-operated clutch, il Sci Am 113:472 N 27 '15

Shell turning and manufacturing lathe, il Iron Age 96:299 Ag 5 '15

Shell work engine lathes, il Iron Age 95:1394-5

Je 24 '15

Single-purpose chucking turret lathe brought

Single-purpose chucking turret lathe brought out by the Cleveland crane & engineering company, Wickliffe, Ohio. il Iron Age 96:872

company, Wickliffe, Ohio. il Iron Age 96:872 O 14 '15
Single-purpose lathe for shell work. il Iron Age 96:810-11 O 7 '15
Special attachments for engine lathes. il Iron Tr R 57:30-1 Jl 1 '15
32-in. lathe for large shell work. il Iron Age 96:84 Jl 8 '15

Three lathes designed for shell work, il Iron Tr R 57:896-7 N 4 '15

Turret indexing mechanisms, A. A. Dowd, il diags Mach 21:797-801 Je '15

Types of automobile crankshaft lathes. J. C. Spence. Mach 21:569 Mr '15

Types of automobile crankshaft lathes: universal machines for the crankshaft manufacturer and special equipments for the automobile builder. W: O. Strauss. il diags Mach 21:400-3 Ja '15

Universal hollow-hexagon turret lathe. il Iron Age 95:237 Ja 28 '15; Ry Age (Mech ed) 89: 96 F '15

Warner & Swasey turret lathes. il Mach 21: 511-13 F '15

See also Machine shop practice; Machine

#### Latin America

#### Commerce

Commerce

Existing obstacles to the extension of our trade with Central and South America. M. Coster, Elec W 65:1158-9 My 8 '15

Export trade and how to get it. G. F. Bagge-Féron. Elec R & W Elec'n 66:161-4 Ja 23 '15

Monroe doctrine and Latin-American commerce. L. G. Valentine, Am Ind 15:18-19+ Ap '15

See also South America—Commerce

Latin language
How we got our alphabet. W. Rice. Inland Ptr
54:823-4 Mr '15

Launching

Launching calculations. G. H. Barber. diags Int Marine Eng 19:546-50 D '14 Launching data for a battleship: abstract, J: G. Tawresey. Int Marine Eng 20:9-11 Ja '15 Launching of the battleship Arizona. G. H. Barber. il diags Int Marine Eng 20:334-6 Ag '15

Laundry

Amole for laundering woolen goods. Sci Am 112:49 Ja 9 '15

Amole for laundering woolen goods. Sci Am 112:49 Ja 9 '15
Electricity in laundries. il Elec R & W Elec'n 66:617-20 Ap 3 '15
Heating equipment of modern steam laundry. il plan Metal Work 84:515-16 O 22 '15
Large laundry for handling ship washing; abstract. W: Scholz. Am Soc M E J 37:721-2 stract. D'15

#### Law

See also Arbitration and award; Automobile laws and regulations; Building laws; Commercial law; Contracts; Corporation law; Electric engineering—Laws; Electric rail-roads—Law; Engineering law; Federal reserve act; Forestry laws and legislation; Foundry laws; Government regulation of industry; Guaranties and sureties; Heating—Laws; Highway law; Inflammable liquids; International law; Labor laws; Legislation; Liens; Maritime law; Mechanics' liens; Mining laws; Municipal law; Negotiable instruments; Nuisances; Partnership; Patent laws and legislation; Patents; Personal injuries; Picketing; Plumbing laws and regulations; Police; Property; Public service corporations—Law; Railroad law; Sales; Street railroad law; Trademarks; Trusts, Industrial; Water laws; Water rights; Waterworks—Law; Workmen's compensation See also Arbitration and award; Automo-Workmen's compensation

Terminology

Glossary of German and French legal terms. A. J. Wolfe and E. M. Borchard, U S Bur For & Dom Com 97:107-27 '15

Lawyers, See Patent lawyers

Leaching. See Hydrometallurgy

Lead, South Dakota

Social improvement at Lead. Eng & Min J 100: 798-9 N 13 '15

Atomic weights of lead. Sci Am 111:469 D 5

'14 Contributions of the chemist to the lead industry. G. W. Thompson. J Ind & Eng Chem 7:937-8 N '15 Cost of producing lead. Eng & Min J 98:1073-4 D 19 '14 Cost of producing lead. Eng & Min J 98:1073-4

Electrolytic assay of lead, E. A. Lewis, Metal Ind n s 13:463 N '15 Electrolytic lead deposits, F. C. Mathers and A. McKinney, Met & Chem Eng 13:328 My '15

Revision of the atomic weight of lead; the analysis of lead bromide. G. P. Baxter and T. Thorvaldson. Am Chem Soc J 37:1020-7 My '15

Revision of the atomic weight of lead; the analysis of lead bromide and chloride. G. P. Baxter and F. L. Grover. il Am Chem Soc J 37:1027-61 My '15

Use of hydrofluoric acid in the separation of copper and lead from tin and antimony by means of the electric current. L. W. McCay. Am Chem Soc J 36:2375-81 N '14 metallurgy;

See also Jamesonite; Lead m Lead mines and mining; Plumbing

Lead acetate

ead acetate
Equilibrium in the system; lead acetate, lead
oxide, and water, at 25°. R: F. Jackson. Am
Chem Soc J 36:2346-57 N '14; Same. U S Bur
Stand Bul 11:331-45 My 10 '15
Lead acetate test for hydrogen sulphide in gas.
R. S. McBride and J. D. Edwards. diags pls
U S Bur Stand Tech Pa 41:1-46 '14

Lead arsenates

Arsenates Arsenates of lead, H. V. Tartar and R. H. Robinson, Am Chem Soc J 36:1843-53 S '14 Valuation of commercial arsenate of lead. R. H. Robinson and H. V. Tartar. J Ind & Eng Chem 7:499-502 Je '15

Lead borers

Bugs bore into leaded cables, il Eng N 74:1006 N 18 '15

Lead bromide
Revision of the atomic weight of lead: the
analysis of lead bromide. G. P. Baxter and
T. Thorvaldson. Am Chem Soc J 37:1020-7
My '15

Revision of the atomic weight of lead: the analysis of lead bromide and chloride. G. P. Baxter and F. L. Grover. Am Chem Soc J 37:1027-47 My '15

Lead chloride

Revision of the atomic weight of lead: the analysis of lead bromide and chloride. G. P. Baxter and F. L. Grover. Am Chem Soc J 37:1047-61 My '15

Lead hydrogen arsenate

Equilibrium in the system disodium hydrogen arsenate, lead nitrate, and water at 25° C.

B. E. Curry and T. O. Smith. Am Chem Soc J 37:1685-8 JI '15

Lead industry and trade Lead and zinc movement. Eng & Min J 100: 397 S 4 '15

Lead statistics. Eng & Min J 99:57-61 Ja 9 '15

Lead metallurgy
Advantages of high-lime slags in the smelting
of lead ores. S. E. Bretherton. Am Inst Min
E Bul 104:1595-9 Ag '15; Abstract. Met &
Chem Eng 13:766-7 O 15 '15; Discussion. 108:
2479-81 D '15

E Bul 104:1595-9 Ag '15; ADSTRACL MET & Chem Eng 13:766-7 O 15 '15; Discussion. 108: 2479-81 D '15

Effect of Zn<sub>2</sub>Ag<sub>2</sub> upon the desilverization of lead. F. C. Newton. Am Inst Min E Bul 98: 473-7 F '15: Same cond. Met & Chem Eng 13:181 Mr '15; Discussion, Am Inst Min E Bul 101:1170-3 My '15

Lead smelting at El Paso. H. F. Easter. Am Inst Min E Bul 104:1493-1506 Ag '15; Excepts. Eng & Min J 100:356-7 Ag 28 '15; Abstract. Met & Chem Eng 13:814 N 1 '15

Metallurgy of lead in 1914. H. O. Hofman. Eng & Min J 99:89-91 Ja 9 '15

New mill of the Daly West mining co., Park City, Utah. L. O. Howard. il plan Met & Chem Eng 13:597-602 S 15 '15

Newnam hearth. W: E. Newnam. il Am Inst Min E Bul 106:2139-45 O '15; Same. Eng & Min J 100:628-30 O 16 '15; Excepts. Met & Chem Eng 13:974 D 15 '15

Sampling lead bullion; excepts. F. D. Weeks; H. F. Easter. Met & Chem Eng 13:930 D 1 '15

Smelting and refining of lead. H. O. Hofman. Met & Chem Eng 13:727-8 O 15 '15

#### Lead mines and mining

## Law

United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 1039-42 '15

## Burma

Bawdwin mines of the Burma corporation, map plan Eng & Min J 99:177-80 Ja 23 '1

## Idaho

New developments in the Coeur d'Alene, Idaho. H. I. Ellis. il Eng & Min J 100:337-40 Ag 28

## Missouri

Southeastern Missouri lead district in 1914. H. A. Wheeler, Eng & Min J 99:60-1 Ja 9'15

Occurrence of silver in argentiferous galena ores, A. E. Nissen and S: L. Hoyt, pls Econ Geol 10:172-9 F '15

See also Jamesonite; Lead mines and mining Lead metallurgy; Lead plating

Preparation and operation of all lead plating baths. F. C. Mathers. Metal Ind n s 13:184-5 My '15

Lead poisoning

ead poisoning
Is the danger from lead poison among operators exaggerated? Inland Ptr 55:515 Jl '15
Lead poisoning in manufacture of storage batteries; abstracts, A. Hamilton, Horseless Age 35:480 Ap 7 '15; Elec R & W Elec'n 66: 1056 Je 5 '15; Eng M 49:442 Je '15
Lead-poisoning symptoms, W. A. Evans, Inland Ptr 56:203 N '15

Lead wool

Lead wool as jointing material; abstracts. C. E. Reinicker, il Am Gas Light J 102:242-6 Ap 19 '15; Eng & Contr 43:520-2 Je 9 '15

Leadership

Deficiency in personality responsible for engineer's failure to receive recognition. G: F. Swain. Eng Rec 71:261-2 F 27 '15

Leadite

Experiences with leadite for jointing cast iron water mains. H. A. Symonds. Eng & Contr 44:247-8 S 29 '15

ow to make good joints in cast iron water mains. W. C. Hawley. Eng & Contr 44:200-2 S 15 '15; Same abr. Eng Rec 72:326 S 11 '15

Least work, Theory of
Arched reinforced-concrete conduits designed
by the theory of least work. W. M. Smith.
Eng Rec 71:648-52 My 22 '15; Discussion. 71:
753 Je 12 '15

Leather

ceather
Contributions of the chemist to the leather industry. W: H. Teas. J Ind & Eng Chem 7:283 Ap '15
Effect of relative humidity on an oak tanned leather belt. W: W. Bird and F. W. Roys. il Am Soc M E J 37:447-9 Ag '15; Same. Iron Tr R 56:1315-17 Je 24 '15; Same. Power 42:169-71 Ag 3 '15; Summary. Iron Age 96: 26-7 Jl 1 '15; Discussion. Am Soc M E J 37:449-51 Ag '15
Manufacture of leather belting. F. H. Small. Am Soc M E J 37:679-82 D '15; Same. Iron Tr R 57:1174-7+ D 16 '15
eather trade

Leather trade

British India. U S Sp Cons Rep 72:290-6 '15 Legal advertising rates. See Advertising-Rates Legislation

egislation
Business man and Congress, L. W. Moffett.
Iron Tr R 55:1229-30 D 31 '14
Business men and public service, P. M. La
Bach, Ry R 56:193-4 F 6 '15
Business men and public service, R, Blankenburg, Ry R 55:775-6 D 26 '14
Rural control of Congress, J. A. Emery, Am
Ind 15:14-15 F '15
Tendencies toward inefficiency in legislation,
R. Walker, Ry Age 58:220-1 F 5 '15 See also Law

Lehigh Valley railroad Annual report for the fiscal year ended June 30, 1915. Ry Age 59:266-7, 303-6 Ag 13 '15

Lenses Manufacture of optical glass in America. Sci Am 112:175 F 20 '15

Am 112:175 F 20 '15

New developments in the projection of light.
L. C. Porter, il Illum Eng Soc 10:38-54 no
1 '15

New lens gives clear vision. Sci Am 112:101 Ja 30 '15

Leprosy Concerning leprosy. Sci Am 113:208 S 4 '15

Lethbridge, Alberta

## Sewerage

Design, construction and operation of Leth-bridge sewage treatment works, plan Eng & Contr 43:401-3 My 5 '15

Letter writing

See also Commercial correspondence

## Letterheads

### Specimens

Letterheads and envelopes. Inland Ptr 55: 208a-208h My '15

Lettering
Advantages of hand-lettering, A. G. Brenton,
Inland Ptr 55:753-6 S '15

Levees

Concrete versus stone revetment, in the Kaw valley levee work, E. D. Murray, il Concrete Cem 6:202-4 Ap '15 East side levee and sanitary district. T. N. Jacob, il diags map Assn Eng Soc J 55:1-11

Experience with cement guns in levee revet-ment. W. G. Caples. Eng & Contr 44:397-8 ment. V N 17 '15

N 17 '16
Experimental Mississippi river levees indicate possibility of eliminating seepage, C. O. Sherrill, il plan Eng Rec 71:552-4 My 1 '15
High levees will protect Indianapolis from floods, il map Eng Rec 72:560-2 N 6 '15
Indianapolis flood protection, il map Eng N 74:961-5 N 18 '15
Levee construction on Trinity river, Texas.
O. W. Finley, Eng & Contr 44:sup29-30 O 6 '15

Method and cost of levee enlargement with a tower dragline excavator, if diags Eng & Contr 43:417-20 My 12 '15; Excerpt. Eng M 49:598-9 Jl '15
Periodical levee slip in Helena, Ark, if Eng N 72:1103 D 3 '14
\$16,000,000 required for Los Angeles county flood protection, diags Eng Rec 72:232-3 Ag 21 '15
Stotted nine aids placing of hydraylic fill

Slotted pipe aids placing of hydraulic fill. A. M. Thompson, il Eng Rec 71:534 Ap 24

Engineer's emergency level. A. P. Connor. il Power 42:314 Ag 31 '15

Levers

Suggestions in mechanisms; some curious geo-metric properties of articulated levers. S. D. Mott. Sci Am S 80:77 Jl 31 '15

Lewes, Vivian B., 1851-1915 Sketch. por Illum Engr 8:472 N '15

Liberty, New York

Water supply

Improving Liberty water supply. H: W. Taylor, il Munic J 38:390-1 Mr 25 '15

Liberty bell

Fatigue and disease of metals, P. Kreuzpointer, Iron Age 95:950-1 Ap 29 '15 Liberty bell and disease of metals, il Iron Age 95:391-3 F 18 '15; Same, Sci Am S 79:236-7 Ap 10 '15

Libraries

Library for accounting employees. Elec Ry J 46:953 N 6 '15
Lighting of the Widener memorial library, Harvard university. il Elec R & W Elec'n 67:330-2 Ag 21 '15
Notes on library lighting. A. J. Philip. diags Illum Engr 8:465-71 N '15
Wider use of public libraries. K, C. Walker. Elec Ry J 46:1040 N 20 '15

See also Classification; Engineering libraries; Library architecture; Library service

Libraries, Engineering. See Engineering libra-

Libraries, Railroad. See Railroad libraries

Library architecture

Harry Elkins Widener memorial library, Harvard university, Cambridge, Mass.; views and plans. Brickb 24:pl 106-11 Ag '15

Morris K. Jesup memorial library, Bar Harbor, Me.; views and plans. Brickb 23:pl 177-9 D

Small town library, il plans Brickb 24:9-11 Ja

Widener memorial library, Harvard university. il Arch & Bldg 47:295-301 Ag '15

Library buildings. See Library architecture Library science

See also Classification

Library service Progress of library service. Sci Am 113:285 O

Liens Making water bills a lien on real property. Eng & Contr 42:425-6 N 4 '14

Liens, Mechanics'. See Mechanics' liens Life boats. See Lifeboats

Life preservers

17e preservers Combination traveling-bag and life-preserver, il Sci Am 113:276 S 25 '15 Universal line of life preservers, il Int Marine Eng '20:184-5 Ap '15

Life saving

See also First aid in illness and injury; Lifeboats; Lighthouses; Safety devices

Life saving apparatus

Emergency marine gangway, il Sci Am 112: 410 My 1 '15

See also Lifeboats; Life preservers; Mine rescue work; Safety devices

Lifeboats

New life-boat, il Sci Am 112:491 My 29 '15 See also Davits

Lifting magnets
Handling materials in manufacturing plants.
R. L. Streeter. il Eng M 50:238-44 N '15
Igranic electric company magnet. il diag Engineer 120:110 J1 30 '15
Use of lifting magnets. il diags Engineer 119:
422-4 Ap 30 '15

Light

Color of illuminants; with discussion. L. A. Jones, diag Illum Eng Soc 9:687-709 no 8 '14 Formation of ozone in the upper atmosphere. J. N. Pring. Sci Am S 79:286-7, 303 My 1-8 '15

N. Pring. Sci Am S 19:280-1, 303 My 1-8 '15
Notes on the use of light in cinematograph work. Illum Engr 8:310-14 Jl '15
Optical properties of diffusing media. Illum Eng Soc 10:353-402 no 5 '15
Photo-electricity; the intimate relations of light and electricity. J. A. Fleming. Sci Am S 80:6-7 Jl 3 '15
Photographic value of various illuminants. Illum Engr 8:347 Ag '15
Searching for a reason for eye fatigue. M. Luckiesh. Elec W 66:576-8 S 11 '15
Sensation-white and color-matching white light. Elec W 65:1710 Je 26 '15
Theory of cold light. W. D. Bancroft. Illum Eng Soc 10:289-95 no 4 '15; Same. Am Gas Light J 103:27-8 Jl 12 '15; Same. Sci Am S 80:186-7 S 18 '15
See also Brightness; Color: Color blind-

See also Brightness; Color; Color blindness; Daylight, Artificial; Eye; Glare; Heliotropism; Infra-red rays; Light filters; Light projection; Light signals; Lighthouses; Lighting; Phosphorescence; Photochemistry; Photography; Photomerapy; Radiation; Radioactivity; Reflection (light); Reflectors; Spectrum; Spectrum analysis; Ultra-violet rays; X rays

## Standards

New standard light source. L. A. Jones. Am Gas Light J 101:251-3 O 19 '14; Same. Illum Eng Soc 9:716-27; Discussion. 9:728-33 no 8

Units of brightness. J. R. Cravath. Elec W 66:60-1 Jl 10 '15

Light, Audible. See Optophone

Light, Audiole. See Optophone
Light, Colored
Artificial daylight, H. E. Ives. bibliog il J Fr
Inst 177:471-99 My '14; Same. Sci Am S 78:
396-8, 412-14 D 19-26 '14
Artificial daylight in practice. M. Luckiesh.
il Elec W 66:71-3 Jl 10 '15; Abstract. Eng
M 49:918 S '15

Choice of a group of observers for heterochromatic measurements. H. E. Ives and E. F. Kingsbury. Illum Eng Soc 10:203-8 no

Development of three-color illumination, M. R. Pevear, il Elec W 65:398-9 F 13 '15

Experiments with colored absorbing solutions for use in heterochromatic photometry. H. E. Ives and E. F. Kingsbury. diags Illum Eng Soc 9:795-813 no 8 '14; 10:253-8 no 3

Mobile color and stage lighting. B. Jones. il plan Elec W 66:245-9, 294-7, 346-9, 407-9, 454-6 Jl 31-Ag 28 '15

Spectacular illuminating effects at the Pan-Pacific exposition, il Sci Am 112:180-1 F 20

Light, Physiological effects of Light-stroke, Sci Am S 79:407 Je 26 '15

Light filters for use in photometry; with discussion. C. E. K. Mees. Illum Eng Soc 9: 990-7 no 9 '14 Light filters

990-7 no 9 '14
Mobile color and stage lighting. B. Jones.
Elec W 66:454-6 Ag 28 '15
Photometry of gas-filled incandescent lamps;
with discussion. C. H. Sharp. il Illum Eng
Soc 9:1021-32 no 9 '14
Use of light filters with the tassin metallographic apparatus. F: H. Getman, il diag J
Ind & Eng Chem 7:431 My '15

Light projection
Illumination of signs and building exteriors by
projectors, il diag Elec R & W Elec'n 66:
1008-9 My 29 '15

1008-9 My '29 '15
Incandescent lamps for projectors. L. C. Porter, il Gen Elec R 18:371-6 My '15
Lamps for projection purposes: committee report. Illum Eng Soc 10:527-30 no 7 '15; Same. Illum Engr 8:446-8 N '15
Method for determining the range of search lights. A. Blondel, Illum Engr 8:85-90, 153-9 F, Ap '15
Method of billboard lighting that saves cash. il Elec W 66:1201 N 27 '15
New developments in the projection of light. L. C. Porter, il Illum Eng Soc 10:38-54 no 1 '15 L., 15

Projector lighting for the protection of bathing beaches, il Elec R & W Elec'n 67:485 S

Sign and building exterior illumination by pro-jection. K. W. Mackall and L. C. Porter, il diags Gen Elec R 18:282-7 Ap '15 Unusual lighting effects at night pageant. Il Elec R & W Elec'n 67:332-4 Ag 21 '15

Light ships

Lighthouse illumination, R. Haskell. Illum Eng Soc 10:207-18 no 3 '15 Light signals

Automatic drawbridge signal, diag Eng Rec 70: 680 D·19 '14
Beam-light signals on the Pennsylvania, Ry Age 58:61 Ja 8 '15
Lamp signals for day service on electric railways, il Eng N 72:1260-1 D 24 '14
Position light signals on the Pennsylvania R. R. il Ry R 56:487-8 Ap 10 '15

See also Searchlights

Lighthouse service (United States)
U. S. lighthouse service. G: R. Putnam. il
diags Eng N 73:614-19 Ap 1 '15; Abstract. Sci
Am 113:157 Ag 21 '15

Lighthouses

Building a lighthouse on shifting sand. H. J. Shepstone, il Sci Am 112:287-8 Mr 27 '15 Lighthouse illumination. R. Haskell. Illum Eng Soc 10:209-18 no 3 '15

Equipment

Inspection by automatic devices. ford, il Engineer 118:612 D 25'1 E. O. Cat-

Lighthouses, Concrete Concrete superseding wood in lighthouse con-struction. J. G. McCurdy. il Concrete Cem 6:198 Ap '15

Lighting

Art and science in home lighting; with discussion. G: W. Cassidy. il Illum Eng Soc 10:55-81 no 1 '15; Abstract. Elec W 65:484-6

10:55-81 no 1 '15; Abstract, Elec W 65:484-6 F '20 '15

Artificial daylight. H. E. Ives, bibliog il J Fr Inst 177:471-99 My '14; Same. Sci Am S 78:396-8, 412-14 D 19-26 '14

Artificial daylight—its production and use. M. Luckiesh and F. E. Cady, bibliog Illum Eng Soc 9:839-64 no 8 '14; Same. Am Gas Light J 101:390-1 D 21 '14; Discussion. Illum Eng Soc 9:864-72 no 8 '14; Discussion. Illum Eng Soc 9:864-72 no 8 '14; Discussion. Am Gas Light J 101:391- D 21 '14

Bank lighting. F. L. Godinez, il Arch & Bldg 47:256-7 Jl '15

Complexion and lighting effects, J. R. Cravath. Elec W 65:1228-9 My 15 '15

Converting night into day; what the inventor has done for oil, gas and electricity in illumination, il Sci Am 112:535-6+ Je 5 '15

Economies of home lighting; facts and figures on various systems, past and present. R. Trautschold. Sci Am S 79:198-9 Mr 27 '15

Effect of illumination on visual acuity. Illum Engr 8:385-6 S '15

Efficiencies of present-day illuminants; abstract. H. E. Ives. Elec W 65:1614 Je 19 '15 Efficiency of the eye under different conditions of lighting; the effect of varying the distribution factors and intensity. C. E. Ferree and G. Rand, il Illum Eng Soc 10:407-47 no 6 '15 Eye and illumination, H. E. Mahan, Gen Elec R 18:268-72 Ap '15

R 18:268-72 Ap '15
Factors in illuminating engineering. F. K.
Richtmyer. Sibley J 30:48-50 N '15
Ferree test for eye fatigue; with discussion.
J. R. Cravath. Illum Eng Soc 9:1033-59 no 9

J. R. Cravath, Illum Eng Soc 9:1033-59 no 9
'14

Further experiments on the efficiency of the
eye under different conditions of lighting.
C. E. Ferree and G. Rand. ii plan Illum Eng
Soc 10:448-501 no 6 '15

Clare in museum galleries; the psychological
factor in the lighting problem. B: I. Gilman.
diags Arch Rec 38:262-80, 362-78 Ag-S '15
Good and bad in recent lighting development.
J. R. Cravath. il Elec W 66:519-20 S 4 '15
Good lighth—a safety factor in casting plants.
Foundry 43:216-18 Je '15
Good lighting and its immediate effects from
the economic standpoint. V. H. Mackinney
and E. Stroud. Inst E E J 53:829-33 Je 15
'15; Abstract. Elec W 65:1425 My 29 '15
Good natural light—a safety factor. Eng M
49:435-6 Je '15
Holding up the mirror. F. L. Godinez. Arch
& Bldg 47:51-2 F '15
Illuminating engineering in Germany. Illum
Engr 8:460-1 N '15
Illuminating engineering in war time; with
discussion. L. Gaster. Illum Engr 8:13-26
Ja '15

Illuminating engineering society, 9th annual convention, Washington, D. C., Sept. 20-22. Elec R & W Elec'n 67:619-24 O 2 '15 Illuminating engineering society 9th annual meeting. Elec R & W Elec'n 67:574-7 S 25 '15

Illuminating engineering society: report of the committee on progress. Illum Eng Soc 10: 515-61 no 7 '15; Same. Illum Engr 8:409-14, 445-50 O-N '15; Same cond. Am Gas Light J 103:273-9 N 1 '15

Illumination and the human eye. Elec W 65: Mr 6

15 Illumination in the law courts. A. S. Osborn. Illum Engr 7:554 D '14 Illumination of Panama-Pacific exposition. G. L. Bayley. il Elec W 65:391-5 F 13 '15 Illumination systems for good lighting of offices. A. B. Oday and R. E. Harrington. il Elec W 65:814 Mr 27 '15 Knowns and unknowns in the lighting of small interiors. J. R. Cravath. bibliog Illum Eng Soc 10:303-14 no 4 '15; Same. Am Gas Light J 103:49-51 Jl 26 '15; Abstracts. Elec R & W Elec'n 66:815 My 1 '15; Elec W 65:1141 My 1 '15; 15

Light as a factor of efficiency. W. A. D. Evans. il Textile World 48:195-9, 354-7 N-D

Lyans. It Textile World 48:190-9, 504-1 N-D' 14
Lighting efficiency. F. L. Godinez. Arch & Bldg 47:138-9 Ap' 15
Lighting improvements, 1915; tabulation. Munic Eng 48:267 Ap' 15
Lighting of rifle ranges. A. P. Trotter and others. il diags Illum Engr 8:251-81 Je' 15
Lighting of rooms through translucent glass ceilings; with discussion. E. J. Edwards. il Illum Eng Soc 9:1011-20 no 9' 14
Lighting of the Widener memorial library, Harvard university. il Elec R. & W Elec'n 67:330-2 Ag 21' 15
Measurements for the household. diags U S
Bur Stand Circ 55:68-81' 15
Notes on library lighting. A. J. Philip. diags Illum Engr 8:465-71 N' 15
Ye Old Mitre tavern. il Illum Engr 8:322-3 Jl
15
Planning of lighting installations. R. F. Pierce.

Planning of lighting installations. R. F. Pierce. il Am Gas Light J 103:321-2 N 22 '15

Popular talk on semi-indirect lighting. R. F. Pierce, il diags Am Gas Light J 102:369-72 Je 14 '15

Present practise in the use of tungsten filament lamps for the lighting of metal working plants; with discussion. A. L. Powell and R. E. Harrington. il Illum Eng Soc 9: 814-38 no 8 '14

Lighting-Continued

Railway classification yard lighting; with discussion. D. P. Morrison. il plans Eng Soc W Pa 30:641-68 O '14 Relation of light to the proof of documents:

Relation of light to the proof of documents: proper illumination of courts necessary to insure justice. A. S. Osborn. Sci Am S 78:250-1 O 17 '14; Same. Illum Eng Soc 9:998-1006; Discussion. 9:1006-10 no 9 '14 Relative photographic and visual efficiencies of illuminants. L. A. Jones, M. B. Hodgson and K. Huse. J Fr Inst 180:1844-7 O '15 Restaurant lighting. F. L. Godinez. il Arch & Bldg 47:336-8 S '15 Symposium on illumination. Am Gas Inst Pro 9:pt 1, 902-38 '14 Year's progress in illuminating engineering. Illum Engr 8:5-9, 45-50 Ja-F '15 See also Air shafts: Brightness: Car light-

See also Air shafts; Brightness; Car lighting; Church lighting; Electric lighting; Factories—Lighting; Foundries—Lighting; Gas; Gas lighting; Glare; Lamps; Light projection; Lighthouses; Petroleum; Photometry; Schoolhouses—Lighting; Ships—Lighting; Chrott lighting; Thouter Lighting; Street lighting; Theaters-Lighting

## Bibliography

Books on illumination. Illum Eng Soc 10:222-6 no 3 '15

#### Cost

Comparative cost of candle light and electric light. Elec R & W Elec'n 66:1190-1 Je 26 '15 Your lighting bill for 1925. A. W. Deininger. Sci Am S 80:187 S 18 '15

## Laws and regulations

Existing requirements regarding lighting in factories, schools, etc., in various countries. Illum Engr 8:381-3 S '15 ew British lighting regulations. Illum Engr

New Brit 8:423 O

w legislation. Illum Eng Soc 10:557-8 no 7 15; Same cond. Am Gas Light J 103:279 N 1

Suggested code of lighting for factories, mills and other work places in the United States. Illum Engr 8:414-19, 451-5 O-N '15 (to be

## Study and teaching

Illuminating engineering as a branch of technical instruction. C. E. Clewell, diags Illum Eng Soc 10:321-37; Discussion, 10:338-52 no 5 '15

Tables, calculations, etc. on of illumination; des Calculation description method developed to overcome the difficul-ties encountered with indirect or semi-direct light sources. R: C. Powell, Elec W 65:1463-4 Je 5 '15

Flux method of obtaining average illumination, F. A. Benford, jr. and H. E. Mahan. Illum Eng Soc 10:593-603 no 7'15
Short cuts in calculations for lighting systems.
R. F. Pierce. Am Gas Light J 103:289-92 N

implification of illumination calculations. A. S. McAllister. Illum Eng Soc 10:587-91 no 7 '15 Simplification

Lighting fixtures

Development and design of lighting fixtures in relation to architecture, interior decora-tion, and illumination. F. W. Thorpe. il diags Illum Engr 8:102-19; Discussion. 8: 97-9, 120-44 Mr '15

Eye-sight vs. glaring lights and the fixture. F. L. Godinez. Arch & Bldg 46:479-80 D '14 Lighting fixtures profitable side line, il Metal Work 82:736-7 D 4 '14

See also Electric light fixtures; Street lighting fixtures

Lighting plants, Municipal. See Electric plants, Municipal Lightning

Lightning without rain. E. J. D. Coxe. Sci Am 113:141 Ag 14 '15

Nature of ball lightning, K. Wolf, Sci Am S 80:54-5 Jl 24 '15

Thunderstorm and its phenomena. W. J. Hum-phreys. il J Fr Inst 178:755-73 D '14

See also Concrete, Effect of lightning on

Lightning arresters

Automatic-resistance horn-type lightning arrester. il Elec R & W Elec'n 66:38-9 Ja 2 '15; Elec W 65:122 Ja 9 '15 Ground fittings for lightning arresters. il Elec Ry J 46:114 Jl 17 '15 High voltage arrester for telephone lines. E. P. Peck, il Gen Elec R 18:189-94 Mr '15 Horn-gap lightning arrester, il diag Elec W 66:151 Jl 17 '15 Lightning arrester for brick plant. A. P. Broadhead, il Elec R & W Elec'n 67:974 N 27 '15

'15
Lightning-arrester installation. T. Croft. diags
Elec R & W Elec'n 67:512-16 S 18 '15
Lightning arresters; abstract. C. C. Garrard.
diags Elec W 66:1041 N 6 '15
Modern lightning arresters. C: C. Raitt. il
diags Power 40:874-6 D 22 '14
Protecting lightning grounds. Elec R & W
Elec'n 67:979 N 27 '15
Protection and control of industrial electric
power. C: P. Steinmetz. il Gen Elec R 18:
980-1 O '15
Protection of railway signal circuits against

980-1 O '19 Protection of railway signal circuits against lightning disturbances. E. K. Shelton. Gen Elec R 18:1127-8 D '15 Universal lightning arrester. il diag Elec R & W Elec'n 67:82-3 Jl 10 '15

Lightning conductors
Lightning and lightning rods. Sci Am S 80:
160 S 4 '15

i60 S 4' 15
Lightning rods. Sci Am S 79:397 Je 19' 15
Lightning rods for farm buildings. Bldg Age
37:45-6 S' 15
Protection buildings against lightning. G: H.
Armstrong. il Elec W 66:402-6 Ag 21' 15;
Abstract. Eng M 50:462-3 D' 15
Protection of life and property against lightning. O. S. Peters. J Fr Inst 180:473-6 O' 15
Smelter stacks and lightning. il Eng & Min J
98:1005-6 D 5' 14

Lightning protection
Lightning and the automobile. C. L. Johnson.
Sci Am 111:507 D 19 '14
Lightning attraction for water and gas pipes.
H. W. Spang. Eng & Contr 44:340 O 27 '15
Protection from lightning. Sci Am 113:299 O

Report of the committee of A. E. R. A. on lightning protection. Elec Ry J 46:746-7 O 9

See also Lightning arresters: Lightning conductors

### Lightning rods. See Lightning conductors

Lignite

Gas explosions in lignite fired boiler plants; abstract. P. M. Grempe. Am Soc M E J 37:233 Ap '15 Gasification of rough lignite; abstract.

asification of rough lignite; abstract. R. Klostermann. Am Soc M E J 37:182 Mr

Advantages in use of commercially hydrated lime over ordinary slacked lime. E. W. Lazell. Concrete Cem 6:139-40 Mr '15 Agricultural lime. Sci Am S 80:112 Ag 14 '15 Chemical and physical properties of lime. Sci Am S 80:368 D 4 '15 Chemical lime. Sci Am S 80:47-8 Jl 17 '15 Definition and classification of lime. Sci Am S 80:333 Ag 28 '15 Electricity in lime manufacture. A. C. Hewitt. il Elec R & W Elec'n 67:181-4 Jl 31 '15 Excess lime method of water purification. Engineer 120:128 Ag 6 '15 Hydrated lime. Sci Am S 80:91 Ag 7 '15 Hydrated lime in road concrete. Eng N 73:503 Mr 11 '15 Hydrated lime in spouted concrete. G. J.

Mr 11 19 Hydrated lime in spouted concrete. G. J. Griesenauer. Concrete Cem 7:188 N '15 Kilns for lime burning. Sci Am S 80:7 Jl 31 '15 Lime burning. Sci Am S 80:67 Jl 31 '15

Lime concrete extensively used in Burma. Eng Rec 71:797-8 Je 26 '15 India and

Method for the determination of the immediate lime requirements of soils. W. H. MacIntire. il J Ind & Eng Chem 7:864-7 O '15

Modern hydrated lime plant. R: K. Meade, il diags J Ind & Eng Chem 7:427-30 My '15 Newberry rapid lime determination. E. G. Pierce. J Ind & Eng Chem 7:258-9 Mr '15

Continued Lime

Reburning of lime from alkali waste and other forms of precipitated carbonate of lime. forms of precipitated carbonate of lime. R: K. Meade, diag Met & Chem Eng 13:289-90 My '15
Road engineer experiments with hydrated

Road engineer experiments with hydrated lime. Eng Rec 71:798-9 Je 26 '15 Use of lime hydrates in factory-made concrete units. Concrete Cem 7:186-7 N '15

See also Cement

Lime acetate me acetate Hardwood distillation industry in America. E: H. French and J. R. Withrow, il Met & Chem Eng 13:30-9 Ja '15; Same. J Ind & Eng Chem [1:47-55; Discussion. H. O. Chute. 7:55-Chem 7

Limestone

Limestone production and its uses. E. C. Eckel. Eng & Min J 98:989 D 5 '14 Prehistoric irrigation canal in New Mexico. S. M. Johnson. il Eng N 73:561 Mr 25 '15

Lincoln, Paul Martyn, 1870-President Am. Inst. E. E. Eng N 73:390-1 F 25 '15 C: F. Scott. por

Lincoln highway incoln highway
Brick pavement on old gravel road foundation
for portion of the Lincoln highway. F. A.
Churchill. Eng & Contr 43:546 Je 16 '15
Cooperation the keynote of Lincoln highway
movement. Eng Rec 71:274 F 27 '15
Lincoln highway. H. V. Magonigle. Am Inst
Arch J 3:168 Ap '15
Tree planting along the Lincoln highway.
G. R. Nevitt. Am For 21:928-9 S '15
Work of the Lincoln highway committee. E. C.
Jensen. Am Inst Arch J 2:559-60 D '14

Lincoln memorial
Marble columns of the Lincoln mem
J. P. Kirsch. Sci Am 112:267 Mr 20 '15 memorial.

Linen See also Hemp; Textile industry and fab-

inotype
Linotype slugs used as plate base, il Inland
Ptr 56:400 D '15
Machine composition, J: S. Thompson, See
monthly numbers of Inland printer
Measurement of linotype matter, E. M. Keating, Inland Ptr 55:819 S '15
Modern methods of composing type, il Sci Am
S 80:325-6 N 20 '15
Seventy years of inventions, Sci Am 112:517
Je 5 '15
Signs of the times in composing-machinery. Linotype

Signs of the times in composing-machinery. C. D. Bollinger. Inland Ptr 56:184-6 N '15 See also Typesetting machines

Linotype operators
King of the speed merchants, Holo Pau, Hon-olulu. Inland Ptr 54:536 Ja '15

inseed oil
Drying properties of linseed oil treated with
cobalt, lead and manganese elaeostearates.
L: E. Wise and R. A. Duncan. J Ind & Eng
Chem 7:202-5 Mr '15

Iodine number of linseed and petroleum oils.
W. H. Smith and J. B. Tuttle. U S Bur
Stand Tech Pa 37:1-17 '14; Same. J Ind &
Eng Chem 6:994-8 D '14
Use of linseed oil to protect concrete from destruction by alkali. L. A. Waterbury; R. A.
Hart. il Concrete Cem 6:90-3 F '15

Lipases Studies on enzyme action: the lipase of soy beans. K. G: Falk. Am Chem Soc J 37:649-53 Mr '15

Liquefaction of gases
Explosions in air liquefaction plants and their
causes; abstract. W. Bramkamp. Am Soc
M E J 37:401-3 J1 '15

See also Liquid air

Liquid air iquid air Electrical conductivity imparted to liquid air by alpha rays. Sci Am S 79:191 Mr 20 '15 Experiments on the distillation of liquid air in a magnetic field. R. S. McBride, Am Chem Soc J 37:1715-18 JI '15

Industrial uses for liquid air. Eng M 49:118-21 Ap '15

Liquid air as an explosive; abstract. M. borski. Am Soc M E J 37:341-2 Je '15 PrzyLiquid air in industry. J Ind & Eng Chem 7: 255 Mr '15 Manufacture of liquid air. diags Sci Am S 80: 204-5 S 25 '15

Liquid crystals

optical anisotropy of liquid crystals. B. O. Lehmann. Sci Am S 79:80 Ja 30 '15 Sudden changes in the form of liquid crystals. O. Lehmann. il Sci Am S 79:43 Ja 16 '15 Surface tension due to intermolecular attraction. O. Lehmann. diags Sci Am S 80:341 N 27 '15

Liquid fuel

See also Alcohol as fuel; Automobile engines—Fuel; Gas and oil engines—Fuel; Gasoline; Petroleum as fuel

Liquid meters

Iduid meters
Improved Lea v-notch meter integrator, il
Iron Age 96:973 O 28 '15
Laboratory for investigating and testing
liquid flow meters of large capacity;
abstracts. W. S. Giele, il diag Am Soc M E
J 37:165-9 Mr '15; Power 41:69-71 Ja 12 '15;
Discussion. Am Soc M E J 37:169-70 Mr '15
Shapley solution meter. C. Shapley, diag Eng
& Min J 100:885 N 27 '15

Liquids

iquids
Drop weight method for the determination of the surface tension of a liquid. J. L. R. Morgan. Am Chem Soc J 37:1461-7 Je '15
Surface tensions of water, methyl, ethyl and isobutyl alcohols, ethyl butyrate, benzene and toluene. T. W. Richards and L. B. Coombs. il diag Am Chem Soc J 37:1656-76

See also Boiling points; Capillarity; Fluids; Hydraulics; Hydrodynamics; Liquid air; Solution (chemistry)

Liquor problem. See Prohibition

Liquors. See Brewing; Wine

Lithium

ithium in soils. L. A. Steinkoenig, **J Ind &** Eng Chem 7:425-6 My '15 Lithium in soils.

Lithography Architectural draughtsmen: Richard Parkes Bonington. H: Winslow. il Am Inst Arch J 3:159-67 Ap '15

See also Engraving

Little Rock, Arkansas Bridges

Reconstruction of piers of Little Rock Junction bridge across the Arkansas river, C. E. Smith. diags plan Eng & Contr 44:85-8, 124-7 Ag 4, 18 '15

Littoral drift. See Erosion

Live stock

Feeding mine animals. Eng & Min J 100:884 N

See also Feeding and feeding stuffs; Sheep Transportation

Hearing on western freight rate advances. Ry Age 58:700-1, 973-4 Mr 26, My 7 '15 See also Swine-Transportation

Lloyd's
Lloyd's annual report. Int Marine Eng 19:5301 D '14

Load (mechanics)
Curves for strength and deflection of very long
columns, E. L. Robinson, Eng N 73:1108-9

Je 10 15
Distribution of vertical soil pressures; tests at Engineering experiment station of Pennsylvania state college, J. A. Moyer, il Eng Rec 71:330-2 Mr 13 '15
Is a part stronger than the whole? R. Fleming, diags Eng N 74:1026-7 N 25 '15
Large brick piers tested at laboratory of Bureau of standards; abstracts. J. H. Griffith and J. G. Bragg, il Eng Rec 71:460-1 Ap 10 '15; Eng N 74:242-3 Ag 5 '15; Ind Eng 15:106 S '15
Results of some tests of Liboratory

Results of some tests of I-beam connections. C. S. Whitney. diags Eng & Contr 44:35-7 J1 14 '15

Safe eccentric loading of rivets. J. Di Stasio. Sch Mines Q 35:213-22 Ap '14; Excerpt, Eng & Contr 42:512 D 2 '14

Bridges-Load; Strains See also and stresses

Load curves. See Electric plants-Load curves Load dispatching. See Electric plants—Central stations—Management

Load factor

Definition of load factor. Power 42:127 Jl 27 '15 Loading and unloading

coading and unloading
Cost of loading bricks into a box car by means
of a portable belt conveyor. A. C. Haskell,
diag Eng & Contr 44:204 S 15 '15
Electrically operated loader, il Sci Am 112:
386+ Ap 24 '15
Italian machine for loading coal tenders, il
Sci Am 113:225 S 11 '15
Making records with loading machines. F. N,
Loughnan, il Ry Age 58:1443 Je 18 '15
New portable car unloader, il Concrete Cem 5:
270 D '14
Ore unloaders at Philadelphia, il Iron Tr R

270 D '14
Ore unloaders at Philadelphia. il Iron Tr R
56:1009-10 My 20 '15
Portable car unloader for handling sand and
gravel. il Concrete Cem 6:222-3 Ap '15
Saving time in loading and unloading, il diags
Sci Am 113:452 N 20 '15
Unloading cargoes by portable machines, il Int
Marine Eng 20:105-6 Mr '15
Wagon loaders for broken stone, il Eng N
74:176-7 Jl 22 '15

See also Conveying machinery; Dumping appliances; Freight handling; Mechanical handling

Locks (canals and rivers)
Lock gates for Dallas-Celilo canal. diags plan
Eng Rec 70:614-16 D 5 '14
Mitering lock gate at Keokuk presents novel
features. B. H. Parsons. il diags Eng Rec
72:344-9 S 18 '15

72:344-9 S 18 15
One huge single-lift lock at Louisville will guard the entrance to the Portland canal. il plan Eng Rec 71:794-6 Je 26 '15
Sea water to rise into fresh-water canal. P. Whitham, il map Eng N 74:246-7 Ag 5 '15
Submersible lock gate at Keokuk operated by compressed air. B. H. Parsons, il diags Eng Rec 72:446-50 O 9 '15
Tests of butterfly valves. result in modified design, diag Eng Rec 72:449 O 2 '15
200,000 yards of concrete placed for \$800,000 in Lake Washington canal lock, il diag plan map Eng Rec 72:141-3 Jl 31 '15

Locomobiles

High economy of locomobile. W. Turnwald, Power 42:242 Ag 17 '15 Lanz locomobiles and the war, il Power 42:232-

3 Ag 17 '15 Locomobile driven by suction producer abstract. Gwosdz. diags Am Soc M E J 713-15 D '15

713-15 D'15
Self-contained power plant; Buckeye engine company, Salem, Ohio. il diag Iron Age 95: 1056-7 My 13'15
Superheated steam unit; some remarkably economical German engines. W. H. Miller. il Sci Am 112:290-1+ Mr 27'15
Two American-built locomobile power plants. il diags Elec W 65:407-11 F 13'15

Locomotive boilers

ocomotive boilers

Boiler design in respect to heating surface:
calculations based on cylinder horsepower
requirements. F. J. Cole. Ry Age 57:1079-81
D 11 '14; Same cond. Ry Age (Mech ed) 89:
5-6 Ja '15
Boiler shop methods. diags Ry Age (Mech ed)
88:637 D '14
Boiler washing and filling system for small
roundhouses. W: Wells. plan Ry Age (Mech
ed) 89:251-2 My '15
Circulating system for locomotive boilers. il

ed) 89:251-2 My '15
Circulating system for locomotive boilers. il Ry Age (Mech ed) 88:644-5 D '14
Federal government boiler inspection report. Ry Age 57:1196-7 D 25 '14
Locomotive boiler design and mechanical stokers. Engineer 120:156 Ag 13 '15
Master boiler makers' association 9th annual convention. Ry R 56:731-4 My 29 '15
Master boiler makers' convention. Ry Age (Mech ed) 89:309-17 Je '15
Master boiler makers' 9th annual convention. Ry Age 58:1129, 1165-9 My 28-Je 4 '15
Patching boilers according to law. G: G.
Lynch. diags Ry Age (Mech ed) 88:634-6 D
'14
Repairing locomotive boiler tubes. N. H. Ahs-

Repairing locomotive boiler tubes. N. H. Ahsiuolh. il plans Ry Age (Mech ed) 89:83-5 F

Report of the chief inspector of locomotive boilers. F. McManamy. Ry R 56:19-20 Ja 2

esults of the locomotive boiler inspection law, F. McManamy, Ry Age 58:621-2 Mr 19 '15; Same cond. Ry Age (Mech ed) 89:190-1 Ap '15; Same cond. Fower 41:898-900 Je 29 Results

System of water circulation for locomotive boilers. il Ry Age 57:1131-2 D 18 '14 Treatment of water for locomotive use. W. A. Pownall. Am Water Works Assn J 2:434-41 Je '15; Same. Ry R 56:470-2 Ap 3 '15 See also Locomotive fireboxes

Locomotive brakes

Failures of breakdowns of locomotives. R. Weatherburn, diags Engineer 118:575-6 D 18 '14 breakdowns

Locomotive coaling stations. See Coaling stations

Locomotive coaling stations. See Coaling stations
Locomotive engineers
Arbitration award in enginemen's wage controversy; text. Ry Age 58:962-5 My 7 '15
Arbitration of western engineers' and firemen's demands. Ry Age 57:1043-4, 1084-5, 1123-4; 58:97-8, 125-7, 198-200, 232-4, 264-6, 307-10, 363-5, 409-11, 448, 751-2 D 4-18 '14, Ja 15-Mr 12, Ap 2 '15
Award of arbitrators in the western wage controversy. Ry R 56:624-5 My 8 '15
Disturbance over the western arbitration. Ry Age 58:959-60 My 7 '15
Obedience to orders; abstention from liquors.

Age 58:959-60 My 7 '15
Obedience to orders; abstention from liquors.
H. W. Williams, Ry Age 57:1088 D 11 '14
Points for the road foreman, W. P. Danforth,
Ry Age 57:1130-1 D 18 '14
Testimony in the western wage arbitration.
Ry R 56:156-7 Ja 30 '15
Western engineers' and firemen's demands.
Ry Age (Mech ed) 89:56-7 F '15

Locomotive failures. See Locomotives-Failures Locomotive fireboxes

Combustion in locomotive fireboxes. J. P. Neff; J. T. Anthony. diag Ry Age 58:55-7 Ja 8 '15; Same cond. Ry Age (Mech ed) 89:10-11 Ja

'15
Lackawanna locomotive with water tube firebox. il diags Ry Age 58:445-7 Mr 12 '15; Same. Ry Age (Mech ed) 89:222-4 My '15
Removing and replacing fireboxes. Ry Age (Mech ed) 89:316 Je '15
Riegel design of locomotive firebox, Delaware Lackawanna & Western R. R. il diag Ry R 56:311-12 Mr 6 '15
Wrought iron in locomotive fireboxes; abstract. G. Hammer. Am Soc M E J 37:344 Je '15

Locomotive firemen

ocomotive themen

American fireman in France. W. G. Landon.
Ry Age 59:267-8 Ag 13 '15

Arbitration award in enginemen's wage controversy; text. Ry Age 58:962-5 My 7 '15

Arbitration of western engineers' and firemen's demands. Ry Age 57:1043-4, 1084-5, 1123-4;

58:97-8, 125-7, 198-200, 232-4, 264-6, 307-10, 363-5, 409-11, 448, 751-2 D 4-18 '14, Ja 15, Mr 12. Ap 2 '15

Award of arbitrators in the western wage controversy, Ry R 56:624-5 My 8 '15

Performance of locomotive firemen. Ry Age (Mech ed) 89:346 Jl '15

Recommended practices for the employment and training of firemen; T. E. A. committee report; abstracts. Ry R 57:338-40 S 1l '15; Ry Age 59:473-4 S 10 '15

Training of men for firemen. Ry Age (Mech ed) 89:508-9 O '15

Locomotive grates

Hulson locomotive grate with large air open-ings. il Ry Age 59:330-1 Ag 20 '15; Ry Age (Mech ed) 89:431-2 Ag '15

Locomotive headlights

American railway master mechanics' associ-ation committee report. Elec Ry J 45:1116 Je 12 '15

American railway master mechanics' association committee report. Ry R 56:847 Je 19

Locomotive headlight requirements. E. S. Pearce. diags Ry Age (Mech ed) 89:451-3 S '15

Locomotive headlight; with discussion. J Minick, Illum Eng Soc 9:909-36 no 9 '14

Locomotive shops

Boiler shop methods. diags Ry Age (Mech ed) §8:637 D '14

88:637 D 14
Boring and facing back end main rod brasses and driving boxes. M. Flanagan. il diags Ry Age (Mech ed) 89:239-40 My '15
Care of lye tanks. J. A. Jesson. diag Ry Age (Mech ed) 89:18N Ap '15
Chicago & Alton railroad—one large building houses all departments of locomotive repair shops at Bloomington, Illinois. il diag plan Eng Rec 71:487-8 Ap 17 '15
Electric locomotive repair shops, New York, New Haven & Hartford R. R., Van Nest, New York, diag plans Ry R 57:363-5 S 18 '15
International railway general foremen's 11th annual convention. Ry Age (Mech ed) 89:417-26 Ag '15

Locomotive repair shops of the Chicago & Alton R. R. at Bloomington, Ill. il diag plan Ry R 56:3-6 Ja 2 '15 Ry R 56:3-6 Ja 2 '15
Machine tool equipment of the new locomotive repair shops, Chicago & Alton R. R., Bloomington, Ill. plans Ry R 56:79-82 Ja 16 '15
New engine terminal for the O. W. R. R. & N. co., Spokane, Wash. il plans Ry R 57: 586-9 N 6 '15

Piece work and bonus systems in the boiler shop. N. H. Ahsiuolh. Ry Age (Mech ed) 89: 240-2 My '15

240-2 My '15
Railroad locomotive repair shop organization.
H; Gardner. Ry Age 59:697-9 O 15 '15
Spo efficiency; report of International railway general foremen's association committee, Ry Age (Mech ed) 89:421-3 Ag '15; Same cond.
Ry Age 59:155-6 Jl 23 '15
Special jigs for locomotive repair shops, Il

pecial jigs for locomotive repair shops, diags Ry Age (Mech ed) 89:409-12 Ag '15

Locomotive sparks
Possibility of fire from locomotive sparks. Ry
Age 58:267-8 F 12 '15

Locomotive steel. See Locomotives-Manufac-

Locomotive stokers, See Stokers, Mechanical

Locomotive tenders

Calibration charts for Vanderbilt tenders. T. Price. Ry Age (Mech ed) 89:563-5 N '15 Good features of tender tank design. W. R. Hedeman. diags Ry Age (Mech ed) 89:224-5

Self-trimming locomotive tender, diag (supp) Engineer 120:280 S 17 '15 Tender derailments, G. W. Lillie, Ry Age ender derailments. ( (Mech ed) 89:58 F '15

Locomotive terminals

Occomotive terminals

Design features of the Lake Shore & Michigan

Southern Ry. engine terminal at Air Line

Junction, Ohio. diags plan Eng & Contr 43:

97-8 F 3 '15

Finley yard of the Southern railway at North

Birmingham, Ala. il plans Ry R 57:355-60 S

Improvements at the Englewood locomotive terminal and car repair plant, L. S. & M. S. Ry., Chicago. il diags plans Ry R 55:679-83 D 5 '14

See also Roundhouses

Locomotive trade

American locomotive builders and foreign trade. W. Fawcett. Ry Age 59:643-4 O 8 '15

Locomotive trucks
Length of radius bar for two-wheel trucks
L. R. Pomeroy. Ry Age (Mech ed) 89:290-1
Je '15

Locomotives

American railway master mechanics' association 48th annual convention. Ry R 56:806-9, 847-53 Je 12-19 '15

9, 847-53 Je 12-19 '15
Baldwin locomotives at the Panama Pacific exhibition. il Engineer 119:452-3 My 7 '15
British-built four-cylinder express locomotive for the Sao Paulo Ry., Brazil. F. C. Coleman. il Ry R 56:47-8 Ja 9 '15
British locomotive reconstruction. F. C. Coleman. il Ry R 56:48-9 Apr 3 '15
Canadian Pacific mountain type locomotives. W. H. Winterrowd, il diags Ry Age 59:862-5 N 5 '15

Cars and locomotives ordered and built in 1914. Ry Age 58:15-20 Ja 1 '15

ars and locomotives ordered in 1914. Ry R 56:36-41 Ja 2 '15 Cars

ombined rack and adhesion locomotive, South Indian railway. F. C. Coleman. il Ry R 57:296-7 S 4 '15 Combined

Compound locomotive-Swedish state railways.

5:1236-7 S 4 '15
Compound locomotive—Swedish state railways. il Engineer 119:429 Ap 30 '15
Contrast in locomotive practice. H. T. Walker. il Sci Am 113:60 J1 17 '15
Counterbalancing of locomotives. S. G. Thomson. Ry R 57:139-42 J1 31 '15
Decapod locomotives for the Russian state railways. il diag Ry R 57:261-2 Ag 28 '15; Ry Age 59:474-6 S 10 '15
Dendy Marshall system of four-cylinder locomotive. il diag Engineer 120:320-1 S 24 '15
Developments in steam locomotives. G: R. Henderson. Ry Age 58:897-900 Ap 23 '15
Double-ender military locomotives. H. T. Walker. il Sci Am 113:139 Ag 14 '15
Eight-wheel switching locomotives for the Lehigh & New England R. R. il diags Ry R 57:293-4 S 4 '15
Erie 2-10-2 type locomotive. il diags Ry Age 58:706-8 Mr 26 '15; Same. Ry Age (Mech ed) 89:158-60 Ap '15
Examples of recent locomotives of the Atlan-

58:706-8 Mr 26 '15; Same. Ry Age (Mech ed) 89:158-60 Ap '15
Examples of recent locomotives of the Atlantic, ten-wheel American, Mogul, and switching type arranged in order of total weight. Ry Age (Mech ed) 89:396 Ag '15
Examples of recent locomotives of the Mallet, Santa Fe and Consolidation types arranged in order of total weight. Ry Age (Mech ed) 89:292 Je '15
Examples of recent locomotives of the mountain and Facific and Mikado types arranged in order of total weight. Ry Age (Mech ed) 89:338-9 Jl '15
Factor of adhesion. E. F. Givin. Ry Age 59: 454 S 10 '15
Factor of adhesion. G. Baxter. Ry Age 59:638

Factor of adhesion. G. Baxter. Ry Age 59:638 O 8 '15

Factor of adhesion in steam locomotives. E. F. Given. Ry Age 58:961 My 7 '15 Fireless locomotives; abstract. Am Soc M E J

Fireless locomotives; abstract. Am Soc M E J 37:344 Je '15
First 4-8-2 locomotives in Canada. W. H. Winterrowd. il diags Ry Age (Mech ed) 89: 556-61 N '15
4-4-4 type locomotive, Philadelphia & Reading Ry. il diags Ry R 56:747-52 Je 5 '15
Front ends, grates and ash pans. Ry Age (Mech ed) 89:281-2 Je '15
Grand Trunk locomotives for suburban service. il diag Ry Age 58:628-9 Mr 19 '15; Same cond. Ry R 56:422-4 Mr 27 '15
G. E. R. suburban passenger tank engine. il

Same cond. Ry R 56:422-4 Mr 27 '15
G. E. R. suburban passenger tank engine. il
Engineer 119:106 F 12 '15
Heavy 4-8-2 locomotive for South African railways, il diags Engineer 118:580-1 D 18 '14
Large steam locomotives, present and future:
possibilities in the use of three cylinders;
compounding; effect of trailer trucks on boiler capacity. Ry Age 58:123-4 Ja 22 '15
Locomotive development in 1914. Ry Age 58:
4 Ja 1'15

er capacity. Ry Age 58:123-4 Ja 22 '15 Locomotive development in 1914. Ry Age 58: 4 Ja 1 '15
Locomotive front ends, 1853-1913. C. T. Rommel. diags Ry Age (Mech ed) 88:617-20 D '14
Locomotive of the future. H. T. Walker. il Sci Am 113:156 Ag 21 '15
Locomotives ordered in America for foreign countries. il Ry Age 59:1011-13 N 26 '15
Locomotives recently built for foreign countries. il Ry Age 58:1407-10 Je 18 '15
Magnolia cut-off improvement on the Baltimore and Ohio railroad. A. W. Thompson. il Eng Soc W Pa 30:827-35 D '14
Mikado and Pacific type locomotives for the Nashville, Chattanooga & St. Louis Ry. il diags Ry R 56:551-3 My 1 '15; Same. Ry Age 58:976-7 My 7 '15
Mikado locomotives for the Georgia R. R. il diags Ry R 56:551-3 Ap 24 '15
Mikado versus consolidation locomotives: a study for the purpose of determining the economical distribution of power from a net revenue standpoint. N. D. Ballantine. Ry Age 59:933-5 N 19 '15
Mineral traffic engine. Barry railway. il Engi-

Mineral traffic engine, Barry railway, il Engineer 118:531 D 4 '14

Modernizing locomotives on the Kansas City Southern, il Ry Age 58:371-2 F 26 '15

Motive power transformations, New York Central lines. il diags Ry R 56:305-9 Mr 6 '15

Mountain type locomotives for the Seaboard air line, il diags Ry R 56:825-7 Je 19 '15

Locomotives—Continued

Number and types of locomotives on British railways. Engineer 120:108-9 Jl 30 '15

Pacific and Mikado type locomotives for the New Orleans & Northeastern. il Ry Age 58: 134-5 Ja 22 '15

Pacific type locomotive for the Chicago, Burlington & Quincy R. R. il diags Ry R 57: 170-2 Ag 7 '15; Same. Ry Age 59:275-8 Ag 13 '15

170-2 Ag 7 '15; Same. Ry Age 59:275-8 Ag 13 '15
Pacific type locomotive: maximum tractive effort of 46,600 lb. il diags Ry Age (Mech ed) 88:614-16 D '14
Pacific type locomotives, Chesapeake & Ohio railway. il diags Ry R 55:708-10 D 12 '14
Pacific type locomotives for the Delaware & Hudson co. il diags Ry R 55:763-5 D 26 '14
Pacific type locomotives for the Union Pacific. il Ry Age 58:781-2 Ap 9 '15
Passenger locomotives for the Great Northern: Pacific and mountain types, il diags Ry Age (Mech ed) 89:116-17 Mr '15
Porsible advantages to be derived from compounding superheater locomotives. L. H. Fry. Ry R 56:808-9 Je 12 '15
Possibilities of the future. J. B. Ennis. Ry Age (Mech ed) 89:14 Ja '15
Progress in locomotive design. diag Engineer 119:17-20 Ja 1 '15
Reciprocating and revolving parts. H. A. F. Campbell, il diags Ry Age (Mech ed) 89: 109-15, 163-9, 215-16, 390-2, 443-51 Mr-My, Ag-8 '15
Santa Fe Pacific type locomotive single expansion engine equipmed for burning fuel

Ag-S '15
Santa Fe Pacific type locomotive; single expansion engine equipped for burning fuel oil. il diags Ry Age (Mech ed) 89:217-19 My '15; Same. Ry Age 58:793-5 Ap 9 '15
Santa Fe type locomotive for the Erie R. R. il diags Ry R 56:454-7 Ap 3 '15
Seaboard air line mountain type locomotives. il diag Ry Age 59:87-9 JI 16 '15
Six-cylinder compound locomotive-Erie railroad, il Engineer 119:213-14 F 26 '15
Steam locomotive of to-day. Sci Am 113:4 JI 3 '15
Steam locomotive of today: discussion Ry Age

Steam locomotive of today: discussion. Ry Age

Steam locomotive of today: discussion, Ry Age (Mech ed) 89:5-14 Ja '15
Steam locomotives of to-day, Am Soc M E J 37:21-3; Discussion, 37:23-35 Ja '15
Steam locomotives of today: discussion, F. J. Cole, Ry R 56:213-15 F 13 '15
Tank locomotives for the Gold Coast railways, il Engineer 119:201 F 26 '15
Thirty years of locomotive progress in Egypt, E. L. Ahrons, diags Engineer 118:499-501 N 27 '14
Three-cylinder locomotives, Ry Age 58:215-16

Three-cylinder locomotives. Ry Age 58:215-16

F 5 '15 Traveling engineers' association 23d annual convention. Ry Age 59:473-4, 505-13 S 10-17

715
Traveling engineers' association 23d annual convention. Ry R 57:337-41, 360-2 S 11-18 '15
Two Pacific type locomotives of high power, il diags Ry Age 57:1183-9 D 25 '14
Types of locomotives on British railways. Engineer 119:62 Ja 15 '15
Utilization of adhesion weight in steam locomotives: abstract. L. Schneider. Am Soc M E J 37:232-3 Ap '15
Why use a high factor of adhesion in steam

Why use a high factor of adhesion in steam locomotives? Ry Age 58:778 Ap 9 '15

See also Electric locomotives; Locomotive boilers and other headings beginning Locomotive; Railroads; Roundhouses; Steam engines; Stokers, Mechanical; Tractors

#### Classification

Universal system of locomotive classification. E. L. Ahrons. Engineer 120:272 S 17 '15

Cost of maintenance and operation

Annual cost of locomotive upkeep. Engineer 119:187, 453-4 F 19, My 7 '15
Cost per day of an engine and crew in yard service. Ry R 57:313 S 4 '15

Economic value of a locomotive. G: S. Good-win. Ry Age (Mech ed) 89:118-20 Mr '15; Same. Ry R 56:257-60 F 20 '15; Same cond. Ry Age 58:305-6 F 19 '15

Locomotive maintenance. Ry Age 59:452-3 S 10 '15

Upkeep of locomotives on Irish railways. Engineer 120:60 Jl 16 '15 Value of a freight locomotive from transportation standpoint. N. D. Ballantine. Ry R 56:596-9 My 1 '15; Same. Ry Age 58:885-8 Ap 23 '15

#### Draft

Draft
Fan drafting as applied to locomotives. H. B.
MacFarland. il diags Ry Age 57:1119-22 D 18
'14; Same cond. Ry Age (Mech ed) 89:6-9 Ja
'15; Abstract. Am Soc M E J 37:27-8 Ja '15;
Abstract. Ry R 56:289-90 F 27 '15
Locomotive front ends and draft appliances.
C. D. Young; C. E. Chambers. Ry Age 58:
273-4 F 12 '15; Same cond. Am Soc M E J
37:28-9 Ja '15; Same cond. Ry Age (Mech ed)
89:9-10 Ja '15
Road tests for determining front end conditions. E. S. Barnum. diags Ry Age (Mech ed)
89:454-6 S '15

## Driving boxes

Machine for boring driving boxes. E. C. Gaines. il Ry Age (Mech ed) 89:138-9 Mr '15 Repairing driving boxes. P. F. Smith. il diags Ry Age (Mech ed) 89:527-9 O '15

## Equipment and supplies

Adjustable hub plate. il Ry Age 59:331 Ag 20

Adjustable hub plate. il Ry Age 59:331 Ag 20 '15 Exhaust nozzle with internal projections. diags Ry Age 58:799 Ap 9 '15; Same. Ry Age (Mech ed) 89:198-9 Ap '15; Same. Ry Age (Mech ed) 89:198-9 Ap '15' Feed water heater used on geared locomotives. H. S. Johnson. diags Ry Age (Mech ed) 89:226 My '15
Franklin automatic adjustable driving box wedge, diags Ry Age (Mech ed) 89:546 O '15 Locomotive and train supplies on the Frisco. il Ry Age 58:697-9 Mr 26 '15
Main reservoir ball joint connection. il diag Ry Age (Mech ed) 89:254 My '15
Modern appliances on large locomotives: T. E. A. report. Ry Age 59:505-7 S 17 '15; Same. Ry Age (Mech ed) 89:199-502 O '15; Abstract. Eng M 50:460-1 D '15
Mudge-Slater spark arrester. G: W. Bender. il Ry R 57:280-1 Ag 28 '15
Present status of the variable exhaust. J. S. Bell. il diags Ry R 56:797-9 Je 12 '15
Rods, tires and wheels: discussion at convention of the General foremen's association. Ry R 57:78-9 JI 17 '15; Ry Age 59:155 Jl 23 '15; Ry Age (Mech ed) 89:420-1 Ag '15
Showing the train number on the engine. W. E. Watts. Ry Age 59:17 S 10 '15
Single locomotive water joint. il diags Ry Age (Mech ed) 89:201 Ap '15
Smokebox blower fitting. il Ry Age 59:1019 N '26 '15
Uncoupling lever for switch engines. G: E.

Uncoupling lever for switch engines. G: E. McCoy. diag Ry Age (Mech ed) 89:115 Mr

Variable blast nozzle on American tives. diags Engineer 120:232 S 3 '15

See also Locomotive boilers; Locomotive brakes; Locomotive fireboxes; Locomotive grates; Locomotive headlights; Locomotives—Superheaters; Stokers, Mechanical

## Exhibitions

Locomotives at the Panama-Pacific exhibition. il Engineer 120:66 Jl 16 '15
Locomotives at the Smithsonian institution. il Sci Am S 80:285 O 30 '15
Railway exhibits at the Panama-Pacific exposition. H. J. Kennedy. il Sci Am S 80:60-2 Jl 24 '15

## Failures

Definition of locomotive failures. Engineer 119: 89-90 Ja 22 '15
Engine failures, their causes and cure. J. E. Anderson. Ry Age (Mech ed) 89:587-8 N '15
Failures or breakdowns of locomotives. R. Weatherburn. diags Engineer 118:547-8, 575-7 D 11-18 '14

#### Fuel

Analysis of dependent sequence as a guide to fuel economy, H. Emerson. Ry R. 57:19-23 Jl 3 '15; Same cond. Ry Age 58:1057-9 My 21 '15; Same cond. Ry Age (Mech ed) 89:273-4 Je '15

Locomotives—Fuel · Continued

Efforts at fuel economy, Rock Island lines.

W. J. Tollerton. Ry R 57:354-5 S 18 '15

Fuel association convention; papers on powdered coal, prevention of smoke, fuel stations, mechanical stokers and fuel oil. Ry Age (Mech ed) 89:271-83 Je '15

Fuel economy on locomotives. il Ry R 57:181-5

Ag 7 '15

Fuel oil for locomotives. G. M. Bean, diagraphy

Fuel economy on locomotives. il Ry R 57:181-5 Ag 7 '15 Fuel oil for locomotives. G. M. Bean. diags Ry R 56:752-6 Je 5 '15; Same cond. Power 41: 900-1 Je 29 '15; Same cond. Ry Age (Mech ed) 89:280-1 Je '15; Same cond. Ry Age 58: 1115-16 My 28 '15; Same cond. Ry Age 58: 92 Jl 31 '15
Fuel oil installations on the Grand Trunk Pacific Ry. J. G. LeGrand. diags Ry R 56:828-31 Je 19 '15
Improved performance with old-type coaling facilities. J. S. Williams. Ry Age (Mech ed) 89:66 F '15
International railway fuel association. 7th annermational railway fuel association.

83:66 F '15
International railway fuel association. 7th annual convention. Ry Age 58:1113-19 My 28 '15
International railway fuel association, 7th annual convention. Ry R 56:696-703 My 22 '15
Powdered coal. W. L. Robinson. Ry Age 58: 1055-6 My 21 '15; Summary, with discussion. Ry R 56:696-7 My 22 '15
Powdered coal, its preparation and use in locomotives and stationary boilers. W. L. Robinson. Ry R 56:772-6 Je 5 '15; Abstracts. Ry Age (Mech ed) 89:271-3 Je '15; Power 41: 793-4 Je 8 '15; Colliery 35:646-8 Jl '15; Sci Am S 80:139 Ag 28 '15
Pulverized fuel for locomotives. Ry Age 58: 941-3 Ap 30 '15; Same. Ry Age (Mech ed) 89:213-15 My '15; Same cond. Eng M 49:440-1 Je '15

Railroad fuel economy. M. C. M. Hatch. Ry R 56:506-9 Ap 10 '15; Same cond. Ry Age 58: 449-51 Mr 12 '15 Saving coal. C: Maier. Ry Age (Mech ed) 89: 442 S '15

Saving of fuel on locomotives by the use of feedwater preheating; abstract. Strahl, diags Am Soc M E J 37:606-7 O '15

See also Locomotives-Smoke problem

### Inspection

Argument rgument against extension of locomotive boiler inspection service. Ry R 56:317-20 Mr

boiler inspection services.

6 '15
Bill extending boiler inspection to entire locomotive. Ry R 56:127 Ja 23 '15
Federal boiler inspectors seek entire control of locomotives. Ry Age 58:293 F 19 '15
Federal inspection of locomotives and tenders. Ry Age 58:451 Mr 12 '15
Federal locomotive inspection. Ry Age 59:906 N 12 '15
Inspection of locomotives and tenders. Ry Age

N 12 '15
Inspection of locomotives and tenders. Ry Age 58:1052-3 My 21 '15
Inspection of locomotives and tenders. Ry Age (Mech ed) 89:284 Je '15
Rules for federal inspection of locomotives and tenders. Ry R 57:307-11 S 4 '15; Same abr. Ry Age 59:426-8 S 3 '15

See also Locomotive boilers

## Lubrication

Double action force feed cylinder lubricator. diags Ry Age 59:612 O 1 '15; Same. Ry Age (Mech ed) 89:489-90 S '15 Lubricating rails on curves to reduce wear. Eng N 73:475 Mr 11 '15

### Manufacture

Manufacture

Heat treated and alloy steels for locomotive parts. C. D. Young. Ry Age 57:1129-30 D 18
'14; Same. Ry Age (Mech ed) 89:13-14 Ja '15
Reciprocating and revolving parts; alloy and heat-treated carbon steel. H. A. F. Campbell. Ry Age (Mech ed) 89:215-16 My '15
Rolled and forged steel pistons. W. W. Scott, jr. il diags Ry R 56:48-52 Ja 9 '15; Same cond. Ry Age (Mech ed) 89:343-5 Jl '15; Abstract. Am Soc M E J 37:191-2 Mr '15
Turning engine bolts. C. L. Dickert. il diags Ry Age (Mech ed) 89:193-4 Ap '15
Use of high-grade alloy steels to reduce weight of locomotives, H. V. Wille. Am Soc M E J 37:31-2 Ja '15

#### Material

See Locomotives-Manufacture

#### Models

Model locomotive built by apprentices at Dun-more, Pa. il Ry Age (Mech ed) 89:456 S '15

#### Operation

Operation

Economic value of a locomotive. G: S. Goodwin. Ry Age (Mech ed) 89:118-20 Mr '15; Same. Ry R 56:257-60 F 20 '15; Same cond. Ry Age 58:305-6 F 19 '15

Effect of water level on superheat. M. C. M. Hatch. Ry Age 59:191 Jl 30 '15

Value of a freight locomotive from transportation standpoint. N. D. Ballantine. Ry R 56:596-9 My 1 '15; Same. Ry Age 58:885-8 Ap 23 '15

## Painting

Painting locomotives and steel cars. M. L. Sims. Ry Age (Mech ed) 88:641-2 D '14; Abstract. Am Soc M E J 37:120-1 F '15

#### Performance

Diagram for determining percentage of maximum tractive effort. L. R. Fomeroy, Ry Age (Mech ed) 89:453-4 S'15 Fuel and tonnage performance on the Seaboard. L. G. Plant, il Ry Age 58:405-8 Mr 5

Locomotive performance on the Great North-ern railway. Engineer 119:549-50, 583 Je 4-11

Number of tons of rail per mile of road; formula for the tractive force of a locomotive.

Colliery 36:144 O '15

Superheater locomotives and grade revision. Ry Age 59:637-8 O 8 '15 Superheater locomotives and grade revision. P. M. La Bach. Ry Age 59:469-71, 848 S 10, N 5 '15

## Repair

Engine house repair work, M. Vallen, Ry Age (Mech ed) 89:85-6 F '15

(Mech ed) 89:85-6 F '15
Factors in locomotive maintenance. E. Becker. Ry Age (Mech ed) 89:140 Mr '15
Locomotive running repairs. E. Cordeal. Ry Age (Mech ed) 89:37-9 Ja '15
Patching boilers according to law. G: G. Lynch. diags Ry Age (Mech ed) 88:634-6 D '14
Repair work at small engine houses. G. H. Roberts. Ry Age (Mech ed) 88:633-4 D '14
Repairing driving boxes. P. F. Smith. il diags Ry Age (Mech ed) 89:527-9 O '15
Running repairs. Ry Age (Mech ed) 89:41-2 Ja '15

See also Locomotive shops

### Smoke problem

Smoke problem

Abatement of locomotive smoke in Cincinnati, G. H. Funk. Ry Age (Mech ed) 89:566 N '15 Difficulties accompanying the prevention of dense black smoke and its relation to the cost of fuel and locomotive repairs; report. Ry R 57:337-8 S 11 '15 Educating enginemen in smoke elimination. Ry Age (Mech ed) 89:216 My '15 Firing up engines at engine houses. Ry Age (Mech ed) 88:636 D '14 Locomotive smoke in Chicago. Ry Age 58:694 Mr 26 '15 Smoke prevention; abstracts. E. W. Pratt. Py

Mr 26 '15
Smoke prevention; abstracts. E. W. Pratt. Ry
Age 58:1059 My 21 '15; Ry R 56:698-9 My 22
'15; Ry Age (Mech ed) 89:274-5 Je '15
Smoke prevention with oil burning locomotives; report; abstracts. Ry Age 59:473 S 10
'15; Ry Age (Mech ed) 89:509 O '15
Smokeless locomotive operation without special
apparatus. H. H. Maxfield. Ry R 57:426-9 O
2 '15; Same cond. Ry Age (Mech ed) 89:561-2
N '15; Same cond. Power 42:491-2 O 5 '15
Washing locomotive smoke. M. D. Franey,
diag plan Ry Age 59:558-60 S 24 '15; Same.
Ry Age (Mech ed) 89:511-13 O '15; Same.
Power 42:561-3 O 19 '15; Same cond. Eng N
74:906-7 N 4 '15; Excerpt. Ry R 57:387-8 S
25 '15 25 '15

## Spring rigging

Spring rigging design. J. P. Shamberger, diags Ry Age (Mech ed) 89:15-18 Ja '15

Characteristics of plate springs. G: S. Chiles. il Ry Age (Mech ed) 89:161-3, 219-22, 340-3 392-5 Ap-My, Jl-Ag '15

Locomotives—Springs—Continued

Master blacksmiths' convention; discussion of
spring making and repairing, il Ry Age
(Mech ed) 89:474-5 S '15

### Stokers

See Stokers, Mechanical

### Superheaters

Discussion on superheating, H. B. Oatley, Am Soc M E J 37:29 Ja '15 Locomotive superheaters, G; L. Bourne, Ry Age 58:96 Ja 15 '15; Same, Ry Age (Mech ed) 89:12-13 Ja '15

89:12-13 Ja '15
Locomotive superheaters. R. M. Ostermann. diags Am Soc M E J 37:388-90 Jl '15
Modern appliances on large locomotives: T. E. A. report. Ry Age 59:505-6 S 17 '15; Same. Ry Age (Mech ed) 89:499-500 O '15; Abstract. Eng M 50:460 D '15
Railroad session of the Chicago section, American society of mechanical engineers. Ry R 56:84 Ja 16 '15
Removing indentations in superheater smoke tubes. H. M. Brown. diags Ry Age (Mech ed) 89:40 Ja '15
Small-smoke-tube superheaters for locomo-

tubes, H. M. Brown, diags Ry Age (Mech ed) 89:40 Ja '15
Small-smoke-tube superheaters for locomotives; abstract. Metzeltin. Am Soc M E J 37: 607-8 O '15
Superheater locomotives and grade revision. Ry Age 59:637-8 O 8 '15
Superheater locomotives and grade revision. P. M. La Bach. Ry Age 59:469-71, 848 S 10, N 5 '15

## Testing

Lateral stresses in rails on straight track, G: L. Fowler, diag Ry Age 58:1231-8 Je 11 '15

'15
Lateral stresses on rails in curved tracks.
G: L. Fowler, il Ry Age 59:319-22 Ag 20 '15
Locomotive tests on the Chicago & North
Western, diags Ry Age 58:93-4 Ja 15 '15
Road tests for determining front end conditions. E. S. Barnum, diags Ry Age (Mech
ed) 89:454-6 S '15
Tests of a mountain type locomotive on the
Rock Island. W. J. Tollerton. il Ry Age 58:
\$29-31 Ap 16 '15

## Valves and valve gear

Application of piston valves to slide valve cylinders, il Ry Age 58:456 Mr 12 '15 Automatic drifting valve, diag Ry Age 59:246

Automatic drifting valve. diags Ry Age 59:912 N 12 '15; Same. Ry Age (Mech ed) 89:593-4

Cylinders and valve gears. G. W. Rink. Ry Age 58:750 Ap 2 '15 Discussion at convention of the General foremen's association. Ry R 57:76-8 J1 17 '15 Effect of valve gear on locomotive operation. W. E. Preston. Ry Age (Mech ed) 89:505-7 O

Heart of the locomotive; the reason

Heart of the locomotive; the reason for the grasshopper valve motions. C. H. Claudy. il diags Sci Am 113:76+ J1 24 '15
International railway general foremen's association; committee report. Ry Age (Mech ed) 89:417-20 Ag '15; Same cond. Ry Age 59:102-4 J1 16 '15
Kingan-Ripken valve gear device, il Ry Age (Mech ed) 89:483-4 S '15
Laying out the southern valve gear, H. Cornell. Ry Age (Mech ed) 89:386 Ag '15
Locomotive safety valve, diag Ry Age (Mech ed) 89:255 My '15
Piston valve packing rings. W. F. Lauer, diags Ry Age (Mech ed) 89:583 N '15
Relief valve for superheater locomotives. W. B. Middleton, diags Ry Age (Mech ed) 89:141-5 Ja '15; Safety cut-out valve, diags Ry Age (Mech ed) 89:44-5 Ja '15; Same. Ry Age 58:708 Mr 26

Slide valve lubrication on the Buffalo, Rochester & Pittsburgh, diags Ry Age 59:283-4 Ag 13 '15 Soo line Walschaert valve gear. W. Smith, diag Ry R 57:311-12 S 4 '15

Southern locomotive valve gear. R. S. Mounce, il diags Ry Age (Mech ed) 89:59-61 F '15

Southern locomotive valve gear. W. Smith. diag Ry R 57:214-15 Ag 14 '15

Systematic valve setting on locomotives. J. R. Britton. Ry R 56:799-800 Je 12 '15; Excerpts. Ry Age (Mech ed) 89:366 Jl '15 Valve gear design and locomotive operation. W. E. Preston. diags Ry Age 59:511-12 S

Walschaert valve gear designed for variable lead. W. Smith. Ry R 57:265-6 Ag 28 '15 Young locomotive valve gear. diags Ry R 57: 312-13 S 4 '15

#### Bibliography

List of references on locomotive valve gear.

Locomotive Firemen and Enginemen's Magazine 58:509-15 My '15

### Wheels

Energy contained in revolving wheels and lo-comotive side rods. W. E. Symons. Ry Age 59:455 S 10 '15

Locomotives, Electric. See Electric locomotives

Locomotives, Electric. See Electric locomotives
Locomotives, Gas and oil
Equalization of masses in motor driven locomotives and oscillations due to it; abstract.
H. Henich. Am Soc M E J 37:558 S '15
Gasoline locomotive haulage; its cost as compared to mule haulage at mines of Trosper coal co., Bradel, Ky. il Colliery 35:547-8 My '15
Gasoline locomotive

Gasoline locomotives. A. H. Ehle. Eng M 48: 915-17 Mr '15; Same. Sci Am S 79:243 Ap 17

Gasolene switching locomotive. il plan Ry Age 58:101-2 Ja 15'15 Switching locomotives driven by gasoline-engine power. il plan Eng N 73:762-3 Ap 22

Locomotives, Industrial
Oil geared construction locomotive. il Eng &
Contr 43:579-80 Je 30 '15; Eng Rec 72:32 Jl

Small locomotives for construction and industrial service. il Eng N 73:964-5 My 20 '15

Locomotives, Mine

Developments in electrical apparatus during 1914. J: Liston, il Gen Elec R 18:87-8 F '15 Gasoline locomotives in relation to the health of miners. O. P. Hood. Am Inst Min E Bul 94:2607-11 O '14; Discussion. 100:892-4 Ap '15 Modern electric mine locomotive. G. Bright. il Am Inst E E Pro 34:1615-20 Ag '15; Same. Colliery 36:145-6 O '15 Modern mine harder of W. Larson. Il

Modern mine haulage motor, C, W. Larson, il Gen Elec R 18:264-8 Ap '15 Storage-battery locomotives. Colliery 35:259-60 D '14

Underground haulage by storage-battery locomotives in the Bunker Hill & Sullivan mine. J. W. Gwinn. il Am Inst Min E Bul 98:239-47 F '15; Discussion. 101:1189-97 My '15

Lodges
Details of an Indiana fishing lodge, il plan
Bldg Age 37:39-40 S '15

Loft buildings

Concrete manufacturing buildings in Hoboken, N. J. il plans Arch & Bldg 47:369-72 O '15 National cloak and suit co's, building, il diag Arch & Bldg 46:451-3 N '14

Logging. See Lumbering

Logwood

Textile World 49:114-16 Ap '15 Logwood dyes. Textile World 49:548-9 Ag '15

## London, England

## Architecture

Church towers, steeples, and spires of Sir Christopher Wren. R. R. Phillips. il Brickb 24:185-9, 228-32 Ag-S '15

#### County hall

London county hall, diags Engineer 120:147-8 Ag 13 '15

Electricity supply

Centralization of London energy supply. Elec W 64:1137 D 12 '14 Linking up the London electric supply sta-tions. Engineer 120:16-17 Jl 2 '15

Lighting

Electric lighting in London. Engineer 119: 360 Ap 9 '15

London, England—Lighting—Continued
Illuminating engineering in war time; with
discussion, L. Gaster. Illum Engr 8:13-26 Ja

ights out: some comments in the press on the lighting conditions in London. Illum Engr 7:516-18 N '14

Engr 7:516-18 N '14 London in the dark, R. K. Cummings, il Munic Eng 48:314 My '15 London's lighting during the war. Illum Engr 8:463-4 N '15 Street lighting of London, W. B. Conant. il Munic Eng 48:333-6 Je '15

## Railroads

Railway problem of London, map Engineer 119:619-20, 632-3 Je 25 '15

### Rapid transit

Extension of the Bakerloo tube. il plans map Engineer 119:29-31, 56-8, 92-4 Ja 8-22 '15 London county council tramways. Engineer 120:13 Jl 2 '15

### Traffic

rowth of London passenger traffic. Eng N 73:1223 Je 24'15

London traffic dangers. Sci Am S 79:213 Ap 3

London traffic in 1913. A. Stanley. Elec Ry J 46:622-3 S 25 '15

### Water supply

supply of London. Engineer 120:266 S

London & South-western railway
Electrification on the London and Southwestern railway. il diags Engineer 120:289-91, 31013, 342, 346-9 S 24-0 8 '15
New electrification work on London suburban
railroads. Elec R & W Elec'n 67:852-4 N 6 '15
Suburban electrification. il Elec Ry J 46:225
Ag 7 '15

#### Long Island

Coast erosion and protection on Long Island and New Jersey. G. O. Case, map Eng N 74:348-51, 388-91, 438-42 Ag 19-S 2 '15

## Long Island railroad

Long Island railroad adopts light, steel trailers, il diags Elec Ry J 46:136-8 Jl 24 '15 Operation in 1914, map Ry Age 58:814-16 Ap 16 '15

### Longitude

ongitude
Longitude determinations of great accuracy.
O. B. French. il Eng N 74:587-8 S 23 '15
Longitudes by wireless telegraphy. F. B. Littell. Sci Am 112:382-3 Ap 24 '15
Washington-Paris longitude by radio signals;
a valuable application of wireless communication. F. B. Littell and G. A. Hill. Sci Am S 79:266-7 Ap 24 '15

## Longleaf pine. See Pine

## Longview, Texas

## Water supply

Vater supply of Longview, Texas. P. E. Green. Am Water Works Assn J 2:416-21 Je Water

Loomis institute, Windsor, Connecticut
Heating equipment in Loomis institute. il
plan Metal Work 83:354-5 Mr 5 '15
Plumbing equipment in Loomis institute. il
diags plan Metal Work 83:323-6 F 26 '15

Automatic loom. il diags Engineer 120:84-6, 88, 132 Jl 23, Ag 6 '15 Improved loom. diag Textile World 48:633-4

Mr '15 Lock washers for draper looms, il Textile World 49:695 S '15

Thin-place preventer for looms. diag Textile World 48:483-4 F '15

Lorries. See Motor trucks; Motor trucks, Military

Los Angeles, California
Los Angeles annexes more territory. B. A.
Heinly, Eng N 73:956 My 13 '15
Panama canal and the ports of the Pacific.
A. J. Quigley, il maps Eng M 48:650-3 F '15

Architecture

First church of Christ, Scientist, il diags plans Brickb 24:pl 86-8 Je '15

### Public works

ost of cement, Los Angeles municipal plant. F. C. Finkle; O. E. Clemens. Eng N 73:229 F 4 '15 Cost of

Los Angeles nears realization of city power plan, il Eng Rec 72:167 Ag 7'15 Water-works farming and forestry by Los Angeles. B. A. Heinly. Eng N 73:745 Ap 15

## Sanitary affairs

Garbage and rubbish disposal in Los Angeles. S. C. Simons, il plan Munic J 38:799-803 Je 10 '15

Method and cost of refuse collection and disposal in Los Angeles. A. C. Hansen, Eng & Contr 44:255-6 S 29 '15

## Sewerage

Beat scheduled time five months in building huge De la Brea sewer. il Eng Rec 72:130-2 Jl 31 '15

#### Water supply

Design and methods and cost of constructing the Los Angeles city trunk line, connecting aqueduct to distribution system. B. A. Heinly. il diags Eng & Contr 43:390-4 My 5

See also Los Angeles aqueduct

#### Wharves

Municipal wharves and sheds at Los Angeles. il diags Eng N 73:824-5 Ap 29 '15

Los Angeles aqueduct
Aqueduct outlet cascades, il diags Eng N 74:
455-6 S 2 '15

405-6 S Z Tb Plan for municipal irrigation from the Los Angeles aqueduct, B, A, Heinly, map Eng N 73:344-6 F 18 '15 Sanitary features of the Los Angeles aque-duct, E, O, Slater, map J Ind & Eng Chem 7:622-5 Jl '15

Lost articles

## Louisiana

#### Industries and resources

Handling lost articles. Elec Ry J 45:28 Ja 2

Petroleum in Texas and Louisiana. A. J. Haz-lett. Eng & Min J 99:137-9 Ja 16 '15 Louisville, Kentucky

# Bridges

irect-lift span provides 55-foot clearance over Louisville and Portland canal, il Eng Rec 72:199-200 Ag 14 '15 Direct-lift

#### Sewerage

Beargrass Creek storm-water channel at Louisville, Ky. J. H. Kimball, il diag plan Eng N 72:1256-60 D 24 '14

Louisville & Nashville railroad
Abstract of annual report, map Ry Age 59:
846-7 N 5 '15
Louisville & Nashville investigation, Ry Age
58:413-14 Mr 5 '15

## Low temperature. See Temperature, Low Lowell, Massachusetts

## Water supply

Lowell filtration plant for removing iron and manganese from water. W. B. Conant. il plan Munic J 39:613-15 O 21 '15

## Lubricants. See Lubrication and lubricants

Lubrication and lubricants
Arrangements to maintain constant oil supply

Arrangements to maintain constant on supply for large generating units. diag Elec W 66: 25 Jl 3 '15 Automobile lubrication. C. W. Stratford. il Sci Am S 79:392-3, 412-14 Je 19-26 '15; Same. Horseless Age '35:879-81; 36:16-19 Je 30-Jl 7

Bearing lubricating system, il Power 42:688 N

Central oiler for vertical crankpin, il Power 41:735 Je 1 '15

Chart illustrating the proper lubrication of the standard motor car chassis; with explanation, il Sci Am 112:18 Ja 2 '15
Circulating-oil system of lubrication, plans Elec W 65:411 F 13 '15

Lubrication and lubricants-Continued

Clutch drive lubricator. il Power 42:329-30 S 7

Compressed air grease cups, diag Mach 21:718

My '15
Counter-current lubricating oil cooler, diag Iron Age 96:199 Jl 22 '15
Cylinder friction and lubrication testing apparatus. A. Flowers, diag Power 42:208-10 Ag 10 '15
De La Vergne oil reclaimer, il diag Power 42: 336-7 S 7 '15; Iron Age 96:1103-4 N 4 '15
Elevator-rail greaser, diag Power 41:82-3 Ja 19 '15
F. E. Wells lubricant pump, il diag Mach 21: Keystone grease retarden diag Down 19:15
Keystone grease retarden diag Down 19:16

679-80 Ap '15
Keystone grease retarder. diag Power 41:11718 Ja 26 '15
Laps and lapping; abstracts. W. A. Knight and A. A. Case. diags Am Soc M E J 37:
451-6 Ag '15; Iron Tr R 57:24-6 Jl 1 '15; Mach 21:976-8 Ag '15; Discussion. Am Soc M E J 37:456-8 Ag '15
Laws of lubrication of journal bearings. M. D. Hersey. Am Soc M E J 37:534-7; Discussion. 37:537-8 S '15
Lubricating oil for Diesel engines and air compressors. H. Moore. Engineer 120:176 Ag

ubricating oil for Diesel engines and air compressors, H. Moore, Engineer 120:176 Ag

20 15 Lubricating oil tests. R. C. Merchant. Colliery 35:615+ Je '15 Lubricating oils in the metal trades. F. Wiess-ner. Metal Ind n s 13:188 My '15 Lubrication. J. W. Fromeyer. Power 41:721-2 My 25 15

My 25 '15
Lubrication of ball bearings. A. V. Farr. Elec
W 65:925-6 Ap 10 '15
Lubrication of ball bearings. L. G. Long. Mach
21:914-15 Jl '15
Lubrication of car journals. W. A. Clark. Ry
Age (Mech ed) 89:19-20 Ja '15
Lubrication of journal bearings. Iron Age 96:
25-6 Jl 1 '15
Lubrication of pregunatic tools. Ry R 57:276-7

Lubrication of pneumatic tools. Ry R 57:276-7 Ag 28 '15

Lubrication troubles. Int Marine Eng 20:512 N

Machine tool lubricant pump. il Ry Age (Mech ed) 89:589-90 N '15 Method of lifting oil for a gravity-feed system

Method of lifting oil for a gravity-feed system by use of condenser vacuum. A. Kuylenstjerna. diags Elec W 66:1149 N 20 '15 Motor cylinder lubrication; abstract. G. S. Bryan. Am Soc M E J 37:293-4 My '15 Nugent pressure return oiling system. il Power 41:90 Ja 19 '15 Oil economizer. diags Power 42:745-6 N 30 '15 Oil troubles experienced in the refrigeration system. A. G. Solomon. Power 42:234-5 Ag 17 '15

17 '15
Phenix oil and graphite cylinder lubricator, diag Power 41:780-1 Je 8 '15
Properties of lubricating oils. O. J. May. Horseless Age 35:338 Mr 10 '15 .
Quick method for testing the non-staining quality of textile oils. T: T. Gray. il Textile World 49:568-9 Ag '15
Slide valve lubrication on the Buffalo, Rochester & Pittsburgh, diags Ry Age 59:283-4 Ag 13 '15
Testing lubricating oils. A. H. Gill. Power 41:

Ag 13 '15
Testing lubricating oils. A. H. Gill. Power 41:
522-3 Ap 13 '15
Tests of lubricants. H. M. Baxter. Ry Age
(Mech ed) 89:225-6 My '15
Theory of lubrication. L. Ubbelohde. Gen Elec
R 18:966-72. 1074-81, 1118-21 0-D '15
Use and abuse of oil at mines. C. T. Thomsen. Colliery 35:665-8 J1 '15
What makes a good lubricant. H. Tipper.
Power 42:452-3 S 28 '15

See also Automobile engines—Lubrication; Bearings; Castor oil; Graphite; Locomotives—Lubrication; Oils and fats

Ludington, Michigan

Sewerage

Sewer construction at Ludington, G: W. Clark, il Munic J 38:62-4 Ja 21 '15

Lumber Electricity in the largest lumber mill; Weyerhaeuser co., Everett, Wash. A. H. Onstad, il Elec W 66:1080-1 N 13 '15
Electricity in the lumber industry. E. F. Whitney. il diags plans Am Inst E E Pro 33:1823-62 D '14; Discussion. 34:439-51 Mr '15

One-third of our lumber wasted. Am For 21: 876-7 Ag '15 Production of lumber in 1913, tables U S Agric

Bul 232:1-32 15

Bul 232:1-32 '15 Proper manner of ordering lumber. T. O. Wood. Ry Age (Mech ed) 89:574 N '15 Substitutes for expensive lumber, W. H. Clif-ton. Ry Age 58:1045-6 My 21 '15; Same. Ry R 56:691-2 My 22 '15; Same. Ry Age (Mech ed) 89:288-9 Je '15

See also Forests and forestry; Lumber-g; Pine; Sawmills; Timber; Wood; Woodworking machinery

Lumber drying

umber drying
Discoloration of maple in the kiln, R. C. Judd,
J Ind & Eng Chem 7:920 N '15
Norfolk & Western humidity-controlled dry
kiln for lumber. W. H. Lewis, il plans Ry
Age (Mech ed) 89:462-4 S '15; Same. Ry Age
59:431-3 S 3 '15

Lumber handling
Application of electric power in a lumber
yard, il diag Elec R & W Elec'n 66:400-1 F
27 '15

24 15 16 Automatic handling of lumber with aid of electric motors and solenoids. il Elec W 66: 704 S 25 '15 Covered slip and pier with gantry cranes for handling lumber. diags Eng N 74:494-5 S 9

Log-handling equipment at Arrowrock dam. C: H. Paul. diags map Eng N 74:200-1 Jl 29

Lumber operations on the Atlantic coast; modern lumber steamer and complete ter-minals under construction for shipping lumber from Florida to New York, diags Int Marine Eng 20:126-8 Mr '15

Eng 20:126-8 Mr '15

Lumber trade
American lumber market. E. B. Hazen. Am
For 21:208-12, 576-81 Mr-Ap '15
Canadian lumber competition. H. D. Langille.
il Am For 21:130-9 F '15
China and Indo-China markets for American
lumber. F. H. Smith. U S Bur For & Dom
Com 104:1-39 '15
European war and the lumber trade. R. C.
Bryant. Am For 20:881-6 D '14
Forest products federation. E. A. Sterling.
Am For 21:55-6 Ja '15
Japanese markets for American lumber. F. H.
Smith. U S Bur For & Dom Com 94:1-16 '15
Lumber industry inquiry. Am For 21:939-40 S
'15

Philippine markets for American lumber. F. H. Smith. U S Bur For & Dom Com 100:1-16 '15 War and lumber. Sci Am 113:194 S 4 '15

Sec also Cedar; Northern white cedar association

Lumbering Electricity in the lumber industry, E. F. Whit-ney. il Am Inst E E Pro 33:1823-31 D '14 Laking, W. R. Brown, il Am For 21:628-36 My

Logging Rasak and Lagan, T. R. Helms, if Am For 21:1050-3 N '15 Southern cypress, W. R. Mattoon, il U S Agric Bul 272:11-17 '15 Topographic surveys for logging operations, E. A. Marshall, il diag Eng N 73:1112-15 Je E. A. 10 '15

See also Lumber trade

Luminosity of animals. See Phosphorescence

Lunch rooms

Industrial betterment, F. E. Cardullo, Mach 22:182-3 N '15

See also Steam tables

Lusitania (steamship) Scientific savagery. Engineer 119:483-4 My 14 15

War, humanized and de-humanized. Sci Am 112:468 My 22 '15 What sank the Lusitania? Sci Am 112:488 My 29 '15

Lye hulling of corn for hominy. J. W. Marden and J. A. Montgomery. J Ind & Eng Chem 7: 850-3 O'15

Lye tanks Care of lye tanks. J. A. Jesson, diag Ry Age (Mech ed) 89:188 Ap '15

Lyndon, Lamar

Builder of the Austin dam, por Elec R & W Elec'n 66:937 My 22 '15

Lyne furnace. See Furnaces

Lynn, Massachusetts

### Railroads

Track elevation at Lunn, C: B. Breed, il diags plans Eng. N 74,533-7 S 16 '15

#### Streets

Street paying in Lynn, H. T. Rich, il Munic J 38:283 1 Mr 4 45

### Water supply

Lynn waterworks improvement. W. B. Conant. il Munie J. 39:651-2 O 28:15

Macadamized roads, See Roads, Macadamized

McChord, Charles C. Shetch, for Ry Age 58:627 Mr 19 '15

Machine design. See Machinery De. ign

Machine expense

Distributing overhead expense, N; T. Ficker, Enc. M 50:350-400 D 45

Machine shop management

Machine shop management
Brief on management, testimony of Carl G,
Barth before the Federal commission on industrial relations, from Age 96, 1665-6 N 1 15
Illimon, Central tool 4v, lem; standardization
and distribution include a central tool room
with an accurate cost system, O, D. Kinsey,
if Rv Age (Mech. 8d) +9,361-1 Jf 15
Inspection, y tem for machine shops, W; B,
We et, Mach 21;Jol-3 F 15
Jobbing machine shop cost system, if Iron Age
96, 863, 0 of 14 Jg.

Jobbing machine shop cost system, il Iron Age 36, 583 a to 14 15 and Modern estimating methods. A. A. Dowd, il diags Mach 21:463-9 F '15 Production and premium system, A. J. Schneider, Mach 21:795-6 Je '15 Salety organization of a machine shop. L. D. Landingsome, il Mach 12:293-9 N '15 Spacing of machines, Mach 21:723 My '15 Using the electric-power meter to measure was ted production, R. E. Loper, Eng M 49: 231-4 My '15 Prinzation of time study data, R. T. Kent, Iron Avec 35 417s, 14 My 27 '15, Same, Iron Tr 1s, 5 4169 13 Je 3 '15; Same, Ind Eng 15:98-103 S '15

ca also Electric railroads Shops; Locomotive shops; Machine shop practice; Productorage italfroads Shop; Repair shops; Scientific management; Shop management

Machine shop practice

lips for commer date tags to steam gages and alct valve. C. L. Dickert, diags Ry Age (Meen ed) 2,131-2 Mr '15

Diagram for determining cutting time. I. Schel-

beck, Mach 21:473 F '15 Doing lathe work on all-geared gang drills, il

diag: Mach 1 to 2 M: 15
Drawing metal tubes of special section. C. L.
Lucas, il diag Mach 21:457-9 F '15
Economical based in an odd machining jobs.
A. A. Dowd, diags Iron Age 95:556-9 Mr 11

Electric power in the machine shop. A. L. De Leeuw, Iron Tr F 10 10 10 7 15 Fitting crown brasses on a draw-cut shaper.

M

il Mach Ford per it Machi 21:718 M.
Ford methods and the Lord open H. L. Arnold: F. L. Faurots of Line M 47:331-58,
507-32, 667-92, 857-86; 48:33-60, 338-66, 70424, 859-76 de G, D 11, 1 Mr 15.
Increasing production: meeting the fatigue
factor at Studebaker op 11, 12, E. Barr, if
Iron Age 95:298-9 F 4 15.
Individual versus group drive machine tools.
C. Fair, Am Inst E E Pro 24:74, 21 N 15.
Machining a piston ring, S. L. Robinson, if
Power 42:24-5 JI 6 15.
Machining and assembling shappned cases,
C. A. Tupper, diags from Age 98:370-3 S 9
15.

Machining castings in the automatic screw machine, E. Whitney, diags Mach 21:381-2

Machining flywheels. il diags Mach 21:813-15

Je '15
Machining high-explosive shells, C. A. Tupper, diag from Age 96,896-9 0 7 '15
Machining irregular contours, A. A. Dowd, diags Mach 21:536-43 Mr '15
Machining motor cycle parts, D. T. Hamilton, il Mach 21:377-80 Ja '15
Machining motor truck sprockets and drums, A. A. Dowd, diags Horseless Age 35:436-9 Mr 31 '15
Machining of a shrappel shell case: the Reed-

Machining of a shrapnel shell case: the Reed-Prentice system. diags Iron Age 95:73-4 Ja

Machining shrapnel shells, D. T. Hamilton, il Mach 21:619-39 Ap '15; Same abr. Sci Am S 80:12-13 Jl 3 '15

80:12-13 Jl 3 '15

Machining shrapnel shells; tool equipment used on the Potter & Johnston automatic chucking and turning machine. Il diags Mach 21:572-5 Mr '15

Machining steel motor truck wheels. A. A. Dowd, diags Horseless Age 34:883-5 D 16 '14

Machining thin bronze bushings. A. A. Dowd, diags Mach 21:980-2 Ag '15

Making cartridge cases. D. T. Hamilton, il diags Mach 21:651-6 Ap '15; Excerpt. Sci Am S 80:29-30 Jl 10 '15

Making fuse parts, il diags Mach 21:641-50 Ap '15

Making superheated steam gate valves, il

Making fuse parts, il diags Mach 21:641-50 Ap '15
Making superheated steam gate valves, il Iron Age 95:345-7 Ap 15 '15
Making the Gilbert wood pulley, il Mach 21: 183:-6 F '15.
Making the Gilbert wood pulley, il Mach 21: 183:-6 F '15.
Making vertical forming tools: practice of the Windsor machine co. C; F. Schlegel, il diags Mach 21:265-71 D '14
Manufacture of chain, F. H. Mayoh, il diags Mach 21:817-20 Je '15
Manufacture of shrapnel, il diag Metal Ind n s 13:137-9 Ap '15
Manufacture of the Diesel engine: production processes and the plant of the Busch-Sulzer bross, St. Louis, O. J. Abell, il diags plan Iron Age 35:57-64 Ja 7 '15
Master blacksmiths' convention; discussion of shop kinks, diags Ry Age (Mech ed) 89: 480-1 S '15
Problem in slotting and intexing, D. A. Hamp-

480-1 S '15
Problem in slotting and indexing, D. A. Hampson, il diags Mach 22:135-6 O '15
Progress in machine shop methods, E. R. Norris, il Iron Tr R 57:679-82+, 747-50 O 7-14 '15
Sweep-milling and shaving operations on pistol frames, il diag Mach 21:686-7 Ap '15
Testing Locke steel sprocket chain. E: K. Hammond, il Mach 22:24-7 S '15
Tool room notes, A. R. Davis, diags Ry Age (Mech ed) 88:638-9 D '14
Valve part manufacturing on a bench lathe, il diags Mach 22:49-50 S '15

Steen Repositions: Chucks: Drafting room

Ree also Broaching; Chucks; Drafting room practice; Drilling and boring; Dynamos; Engines; Forsing; Foundry practice; Gear cutting; Grinding and pollshing; Hobbing; Lathes; Machine shop management; Machine tools; Machinery; Planing machines; Riveting; Sheet metal work; Welding

Convenient power-bouse machine shop, il Elec W 65:1622 Je 19 '15 Cranes for the machine shop and foundry, H. M. Lane. diags Iron Age 96:246-8 Jl 29

Plectric locomotive repair shops, New York, New Haven & Hartford R. R., Van Nest, New York, diag plans Ry It 57:363-5 S 18 '15 Electricity in harvesting machinery works, fl Flec R & W Elec'n 67:745-50, 883-8 O 23; N

Homestead repair shops, il plan Iron Tr R 56:659-65 Ap 1 '15
Hot-blast heating in machine shop and foundry. (Engineers' study course C'; L. Hubbard, diags Power 40:858-60 D 15 '14
Machine shop equipment, methods and process, E. R. Norris, Elec Ry J 46:626-7 S 25 '15

Metal plate floor shop, J. J. Turteltaub, il Iron Age 95:239 Ja 28 '15 Modern sheet metal machinery plant, il plans Metal Work 83:127-9 Ja 15 '15

Machine shops -- Continued

ew England machine tool plant. E. C. Kreutzberg, il plan Iron Tr R 56:1265-9 Je

One-story machine shop at Norfolk Downs, Mass.—designed for two additional stories. il plan Concrete Cem 6:259-60 My '15

Putnam machine company's plant, Fitchburg, Mass.; with diagram of layout. il Iron Age 96:292-5 Ag 5 '15

Shops for repair purposes at Gary. il plan Iron Tr R 56:277-81+ F 4 '15

Snavshots on the road. Mach 21:490-1 F '15

Tr R 56:277-81+ F 4 '15 Snapshots on the road. Mach 21:490-1 F '15

Nec also Bridge shops; Electric railroads—Shops; Locomotive shops; Machine shop management; Machine shop practice; Railroads—Shops; Repair shops; Waste removal

Safety devices and measures

Ford methods and the Ford shops, F. L. Faurote, il Eng M 49:372-93 Je '15 Glass chip guard and box. J. E. Cooley, diags Iron Age 95:1123 My 20 '15 Safety first; Railway tool foremen's association discussion, il Ry Age (Mech ed) 89: 412-13 Ag '15

Safety organization of a machine shop. L. D. Burlingame, il Mach 22:203-9 N '15 Sterilizing cutting oils. P. J. Artale, Iron Age 95:182 F 25 '15

95:182 F 25 '15 Workmen's co-operation reduces accidents. il Iron Age 95:1051-4 My 13 '15

See also Machinery-Safety devices

Machine tool builders' association, National. See National machine tool builders' associ-National.

Machine tool industry
Chinese machine shop of today, F. A. Foster,
Iron Tr R 57:992 | N 18 15
Credit problems of tool builders, Iron Tr R
56:647 Ap 1 15

Hints on selling machine tools. Mach 21:367-8 Ja '15 How to demonstrate machine tools A A

Ja '15
How to demonstrate machine tools, A. A. Dowd, il diag Iron Tr R 57:17-21 Jl 1 '15
How to use the sales engineer, A. A. Dowd, il diags Iron Tr R 56:159-63‡, 667-72, 927-30‡ Mr 4, Ap 1, My 6 '15
Machine-tool builders' spring meeting. Iron Age 95:1173-8 My 27 '15
Machine-tool contracts; confirmed credits and payments against inland shipping documents desired. Iron Age 95:741 Ap 1 '15
Machine tool exports. Iron Age 96:198 Jl 22 '15

National machine tool builders' association annual convention, New York, Oct. 28-29. Iron Age 96:1060-3+ N 4 '15
National supply and machinery dealers' association meeting, New York, Oct. 28. Iron Age 96:1101-2 N 4 '15
National supply and machinery dealers' association meeting, New York, Oct. 28. Iron Tr R 57:908-9 N 4 '15
Railways buy shop equipment, Iron Tr R 56:

Railways buy shop equipment. Iron Tr R 56:

249-51 F 4 '15
Selling machine tools abroad, Iron Tr R 56:
466-8 Mr 4 '15
Solving some war order problems. E. C.
Kreutzberg, il Iron Tr R 57:433-6+ S 2 '15
South American markets for machine tools.
B. O. Hough, Mach 21:545-6 Mr '15
Speeding up manufacture of machine tools.
Iron Age 96:405-7 Ag 19 '15

Machine tools

Adjustable and multi-cutting turning tools. A. A. Dowd. diags Mach 21:825-6 Je '15 Adjustable and multi-cutting turning tools. F. H. Mayoh. diags Mach 21:302-3 D '14 American railway tool foremen's association 7th annual convention. Ry R 57:115-17 J1 24 '15

Automatic electrical tools. il Mach 22:245-6 N

Automatic machine development. R. E. Flanders, il Iron Tr R 57:885-93+ N 4 '15 Bullard multimatic machines Ford flywheel 1 min. 44 sec. il Automobile 33:666 O 7 '1

Conradson hydraulically operated, six-spindle, vertical, automatic chucking, boring and turning machine, il Iron Tr R 56:920-2 My

Don'ts for tool designers. E: J. Utz. Mach 22: 43 S '15

43 S '15
Electric power in the machine shop. A. L. De Leeuw. Iron Tr R 57:888-90+ O 7 '15
Electrical appliances for workshops. il Engineer 119:474-6, 546-9 My 14, Je 4 '15
53-in. boring and turning mill. il Iron Age 96:
161 Ag 26 '15; Iron Tr R 57:111 S 2 '15
Ford methods and the Ford shops. F. L. Faurote. il diags Eng M 49:184-201 My '15
High speed steel tipped tools. J. W. Pike. il
Ry Age (Mech ed) 89:590 N '15
How machine tools and appliances are sized.
F. Horner. Mach 21:487-9 F '15
Improved method of facing and counterboring.
O. A. Webster. diag Mach 21:499 Ja '15
Machine tool development discussed by mechanical engineers. Iron Tr R 56:879 Ap 29

Machine-tool developments of 1914; abstract. L. P. Alford, Am Soc M E J 37:414-15 Jl '15 Machine tool equipment of the new locomotive repair shops, Chicago & Alton R. R., Bloom-ington, Ill. plans Ry R 56:79-82 Ja 16 '15 Machine-tool performance diagnosis: lessons

Machine-tool performance diagnosis: lessons of the power-time characteristic and value of automatic records on analyzing productive operations. Elec W 65:417-18 F 13 '15 Machinery for the production of projectiles. il diags Engineer 119:572-6, 599-602, 634-6; 120:8, 116-17, 278, 338-9 Je 11-Jl 2, 30, S 17, O

8 '15
Machines for making projectiles, il Iron Tr
R 56:383-4+ F 18 '15
Machines for Warner gear making, il Automobile 32:1129 Je 24 '15
Machining irregular contours, A. A. Dowd, diags Mach 21:536-43 Mr '15
Machining shrappnel shells, D. T. Hamilton, il Mach 21:619-39 Ap '15; Same abr. Sci Am S 80:12-13 Jl 3 '15
Making aero motor pistons; tool equipment used on Cleveland automatics, D. T. Hamilton, il diags Mach 21:300-2 D '14
Making cartridge cases, D. T. Hamilton, il diags Mach 21:651-6 Ap '15; Excerpt, Sci Am S 80:29-30 Jl 10 '15
Making fuse parts, il diags Mach 21:641-50 Ap '15

Making vertical forming tools: practice of the Windsor machine co. C: F. Schlegel. il diags Mach 21:265-71 D '14 Manufacture of chain. F. H. Mayoh. il diags Mach 21:719-23 My '15 Power formulas for machine tools. A. D. Du-Bois. Elec W 65:928-33 Ap 10 '15

Progress in machine shop methods. E. R. Nor-ris, il Iron Tr R 57:679-82+, 747-50 O 7-14 '15

Quadruple tool for planing shoes and wedges. E. A. Murray. il diags Ry Age (Mech ed) 89: 584 N '15

Shall we use wide or narrow guides? S. C. Bliss, diag Mach 22:147 O '15

Special jigs for locomotive repair shops. il diags Ry Age (Mech ed) 89:409-12 Ag '15

Three projectile machines, il Iron Age 95:402-3 F 18 '15

Tools for making a double-pronged rivet. il diags Mach 21:299 D '14

Value of specialization in factory. A. A. Dowd. il diags Iron Tr R 57:259-63 Ag 5 '15

il diags Iron Tr R 57:259-63 Ag 5 '15

See also Abrasives; Bending machines;
Centering machines; Chucks; Cutting
machines; Drilling and boring machinery;
Electric driving; Grinding and polishing;
Grinding machines; Hobbing; Lathes; Machine shop practice; Milling machines; Planing machines; Pneumatic tools; Punching
machinery; Reamers; Screw machines;
Shears; Tapping machines; Thread cutting
machines; Tool steel; Wire-working machinery; Woodworking machinery

Depreciation

Depreciation of machine tools: abstract. Ind Eng 14:409 O '14

See also Machinery-Valuation

Failures

Cause of high speed steel tool failures. G: J. Brunelle, Ry Age (Mech ed) 89:369-70 Jl '15

## Machine tools -Continued

### Fixtures

Adjustable wedge stop in jig and fixture design. R. E. McCoy, diags Mach 21:895-9 JI

Assembling fixture for Franklin front and rear axles. il Mach 21:577 Mr '15
Attachment for drilling small pieces. il Iron Age 95:669 Mr '25 '15
Clamping devices for jigs and fixtures. S. Helweg, diags Mach 21:578-9 Mr '15
Compensating and quick-acting clamping devices. A. A. Dowd, diags Mach 21:355-9 Ja '15

Drill fixtures for motor truck parts. C. T. Schaefer, diags Horseless Age 34:818-19 D 2

E'.14
E'.14
E'.14
E'.14
E'.15
E'.15
E'.16
E'.16
E'.16
E'.16
E'.17

Interchangeable locating and clamping accessories, il diags Mach 21:727-8 My '15
Jig and fixture design, diags Mach 21:580-1

Mr '15
Jig and fixture mechanisms. G: M. Meyncke.
diags Mach 21:970-4 Ag '15
Milling fixture with a knock-out attachment,
F. W. Barrows. diags Mach 21:410 Ja '15
Multiple thread chasing fixture. R. C. MacLachlan. diags Mach 22:233 N '15
Providing for up-keep in designing jigs and
fixtures. A. A. Dowd. diags Mach 22:12-15
S '15

S 15 Safety first; its application to the design of machine fixtures. A. A. Dowd. diags Eng M 49:679-89 Ag '15 Square-end milling fixture. O. A. Webster. il diags Mach 21:1009 Ag '15 Three adaptable milling fixtures. C. F. Meyer. il diags Mach 21:962-5 Ag '15

See also Indexing fixtures; Mandrels

Machines with which machines are made; a brief history, il Sci Am 112:538-9 Je 5 '15

## Manufacture

Illinois Central tool system; standardization and distribution include a central tool room with an accurate cost system. O. D. Kinsey. il Ry Age (Mech ed) 89:361-4 Jl '15 Interchangeability. J. P. Brophy. Mach 21: 967-8 Ag '15

#### Repair

Handling of repair work in the factory. A. A. Dowd. Iron Age 95:994-5 My 6 '15

Machine unit system. See Machine expense Machine work

Effect of design on the cost of machining. A. A. Dowd, diags Mach 21:273-7 D '14

Machinery

lachinery

Efficiency in the purchase of machinery. E. C. Stueler and W. C. Nisbet. Ind Eng 14:337-8 Ag '14: Same. Mach 21:549 Mr '15

Heavy machinery used in building automobiles. Sci Am S 80:279 O 30 '15

How to reduce machine friction. N. G. Near. Metal Ind n s 13:409 O '15

Recent legal decisions involving machinery. Mach 21:979; 22:27 Ag-S '15

Thinking machine, planning and theories. S. B. Russell. il Sci Am 113:246+ S 18 '15

Watching distant machines from a desk. H. T. Wade. il Sci Am 112:161-2 F 13 '15

See also Agricultural machinery. Bears

See also Agricultural machinery; Bearings; Belting; Bookbinding machinery;

Brakes; Calculating machines; Casting machines; Cement machinery; Conveying machinery; Cranes, derricks, etc.; Crank-pins; Crankshafts; Crushing machinery; Dyeing machines; Electric engineering; Electric engineering; Electric machinery; Engineering; Engines; Engraving machines; Excavating machinery; Fans, Mechanical; Fitting (machinery; Forging machines; Foundry machinery; Forging machinery; Foundry machinery; Friction; Gearing; Grinding machines; Hoisting machinery; Hydraulic machinery; Joints; Keyseating machines; Knitting machinery; Lathes; Locomotives; Looms; Lubrication and lubricants; Machine shop practice; Machine tools; Metal working machinery; Milling machinery; Milling machinery; Mining machinery; Nameplates; Paving machinery; Printing presses; Pulleys; Pumping engines; Pumps; Refrigeration and refrigerating machinery; Road making machinery; Screw machiners; Shafting; Shafts; Shoveling machines; Textile machinery; Thread cutting machines; Textile machinery; Typesetting machinery; Valves; Water wheels; Windmills; Wire-working machinery; Wood-working machinery; Woolen and worsted machinery machinery

#### Design

Adjustable wedge stop in jig and fixture de-sign. R. E. McCoy. diags Mach 21:895-9 JI

'15
Aids to designing; proportioning the machine to the size of the man. diags Sci Am S 80: 292-3 N 6 '15
Don'ts for tool designers. E: J. Utz. Mach 22: 43 S '15
Effect of design on the cost of machining. A. A. Dowd. diags Mach 21:273-7 D '14
Floating principle as applied to fixture work. A. A. Dowd. diags Mach 21:701-7 My '15
Machine design in a Rhode Island school. W. E. Freeland, il diags Iron Age 96:1105-7 N 11 '15 W. E. F N 11 '15

N 11 15 Plotting the involute curve. J: Edgar. diags Mach 21:480-2 F '15 Sectional views of ribs and symmetrical parts. C. L. Svensen. diags Mach 21:790-1 Je '15 Use of continued fractions in mechanical prob-lems. W: W. Johnson. il diag Mach 21:802-4 Je '15

See also Ball bearings; Bearings; Belting; Bolts and nuts; Cams; Clutches; Drafting room practice; Gearing; Machine shop practice

## Exhibitions

Manufacturers' exhibits at the Panama-Pacific exposition. Elec W 65:833-6 Mr 27 '15 Mechanical engineering at the Panama-Pacific international exposition. G. W. Dickie. il Am Soc M E J 37:592-600 O '15 Outline of exhibits of products of mechanical engineering at the Worlds' fair at San Francisco, il Iron Age 96:142-9 Jl 15 '15 Panama-Pacific international exposition. il Power 41:250-6 F 23 '15

See Fitting (machinery)

#### Foundations

Anchoring foundation bolts in concrete. T. Croft. diag Power 41:841 Je 22 '15 Concrete engine foundations. H. C. Campbell. Elec W 66:865 O 16 '15

Concrete filling for engine beds and machine frames. F. W. Salmon. il Power 41:94 Ja 19 '15

Concrete foundations for farm engines. Concrete Cem 7:184 N '15

Constructing foundations for electrical ma-chinery. N. G. Meade. diag Power 42:439 S 28 '15

Foundations for jar-ramming molding ma-chines. E. S. Carman. il diags Foundry 43: 420-3 O '15; Same. Iron Tr R 57:1180-3 D 16

Installing rolling-mill anchor bolts. A. Conn-ley. diags Iron Age 96:296-7 Ag 5 '15

# Machinery -- Continued

### Manufacture

Shop system of the American machine & foundry co. E: K. Hammond, diags Mach 21:446-50 F '15

#### Safety devices

Safety devices

Gear guard for lathes. S. K. Eastwood. diag

Iron Age 95:948 Ap 29 '15

Grinding safety devices. C: G. Smith. Iron Age
94:1392 D 17 '14

Guarding of shafting, il Ry R 56:220-1 F 13 '15

Safety feed increases production of punch
press, il Iron Age 95:1333-4 Je 17 '15

Safety first; its application to the design of
machine fixtures. A. A. Dowd, diags Eng M
49:679-89 Ag '15

See also Cranes, derricks, etc.—Safety devices; Grinding machines—Safety devices; Machine shops—Safety devices and measures; Saws—Safety devices

# Testing

Power plant testing. W.  $\overline{\rm M}$ . Selvey. diags Engineer 118:555-6 D 11 '14

#### Valuation

Valuation of machine tools, G: L. Colburn. Mach 21:708-9 My '15

Machinery, Automatic
Automatic machine development. R. E. Flanders. il Iron Tr R 57:885-93+ N 4 '15; Abstract. Iron Age 96:1179 N 18 '15
Torres and his remarkable automatic devices. il diags Sci Am S 80:296-8 N 6 '15

Machinery industry
Comparison card for cost departments. H. A. Russell. Iron Tr R 57:793 O 21 '15
Engineering openings in Russia. Sci Am 112: 331 Ap 3 '15
How to sell tools to the government. L. W. Moffett. il Iron Tr R 56:1101-5 Je 3 '15
Huge iron. steel and machinery exports. Iron Age 96:883 O 14 '15
Machinery exhibitors at the Panama-Pacific international exposition. Iron Age 95:654-5
Mr 18 '15

Machinery markets, 1914. Iron Age 95:124-30

Machinery trade with South America. J. A. Massel. Iron Age 96:1128-9 N 11 '15
Manufacturers' instruction cards helpful. F. W. Fisher. Power 42:418 S 21 '15

Openings for American machinery, J. A. Massel, Iron Tr R 57:707 O 7 '15

War rescues machinery market, Iron Tr R 56:104+ Ja 7 '15

See also Bookbinding machinery

Machines. See Machinery

Machines, Centrifugal. See Centrifugal ma-

Machining, See Machine work

Machinists

Employment of women as machinists, il Engineer 120:218 S 2 115

Machinists' tools Group of machinists' fine tools. il Iron Age 95: 1011 My 6 '15

## McKeesport, Pennsylvania

# Water supply

x years of softened and purified water at McKeesport, Pa. E: C. Trax. Eng & Contr 44:137-8 Ag 25 '15

McKim, Charles Follen, 1847-1909 Personal reminiscenses of Charles Follen Mc-Kim. G. Brown. por Arch Rec 38:575-82, 681-9 N-D '15

McMurty, George Gibson, 1838-1915 Founder of Vandergrift, dies at Atlantic City. por Iron Tr R 57:303 Ag 12 '15

Sketch, R. A. Walker, por Iron Age 96:366-7 Ag 12 '15

# Macon, Georgia

## Streets

Methods and costs of constructing the Bay street underpass at Macon, Ga. C. H. Fuller. il diags Concrete Cem 6:75-8 F"15

#### Madras, India

Water supply

New waterworks at Madras. il diags map Engineer 119:58-9, 78-81 Ja 15-22 '15

Magic squares

Magic squares, W. G. Swart. Sci Am S 78:406 D 26 '14

Magnalium

Reclamation of magnalium from turnings. Coulson. Metal Ind n s 13:455-7 N '15; A stract. Am Soc M E J 37:655-6 N '15

agnesite
Effect of steam upon magnesite brick or calcined magnesite, R. H. Youngman, J Ind & Eng Chem 6:1037 D '14
Magnesia cement, C. H. B, Burlton, Engineer 119:471-2 My 14 '15
Occurrence, preparation and use of magnesite, L. C. Morganroth, il Am Inst Min E Bul 93: 2345-52 S '14; Same cond. Iron Tr R 55: \$22 O 29 '14; Summary, Iron Age 94:8°2 O 15 '14; Discussion, Am Inst Min E Bul 100: 865-7 Ap '15

Magnesium carbonate

agnesium carbonate
Solubility of magnesium carbonate in natural
waters. R. C. Wells. Am Chem Soc J 37:
1704-7 JI '15
Solubility-product constant of calcium and
magnesium carbonates. J: Johnston. Am
Chem Soc J 37:2001-20 S '15

Magnesium chloride

Sulfate method for standardizing a magnesium salt solution. C. W. Foulk and O. R. Sweeney, diags Am Chem Soc J 36:2360-72

Magnesium silicate

Comparison of silicates and carbonates as sources of lime and magnesia for plants. W. H. MacIntire and L. G. Willis, il J Ind & Eng Chem 6:1005-8 D '14

Magnesium sub-oxide

Electrolytic preparation of magnesium. F. C. Frary and H. C. Berman. Met & Chem Eng 13:324 My '15

Magnetic chucks. See Chucks, Magnetic

Magnetic induction
Temperature coefficient of magnetic permeability within the working range. R. L. Sanford. U S Bur Stand Bul 12:1-10 O 28 '15; Excerpts. Sci Am S 79:283 My 1 '15

Magnetic measurements
Decomposing magnetic fields into their higher harmonics. H. Weichsel. Am Inst E E Pro 34:2437-54 O '15
Experiments with a plunger electromagnet; determining the pull on the plunger when it is in motion. B. C. Batcheller, diag Elec W 65:1037-9 Ap 24 '15
Keepsel permeameter C: W. Burrows il diags.

U S Bur Stand Bul 11:101-30 N 15 '14; Abstract. Elec W 65:95-6 Ja 9 '15; Sum-

Reluctance of some irregular magnetic fields. J: F. H. Douglas. diags Am Inst E E Pro 34:867-925 My '15; Discussion. 34:3078-86 D

Unsymmetrical hysteresis loop, J: D. Ball, Am Inst E E Pro 34:2275-97 O '15

See also Magnetic induction

Magnetic separation of ores

Electromagnetic ore separation. I. C. Clark.
diags Eing & Min J. 2005.3-5 M<sup>1</sup>

Electromagnetic zinc-ore treatment by the
Campbell process. L. E. Ives. il diag Eing &
Min J. 99:97-80 Je 5 '15

Magnetic separation of zinc-iron sulphide ores.
il Met & Chem Eing 13:573 S 1 '15

New magnetic iron-ore separator. diag Iron
Age 96:577 S 9 '15

Magnetic separators

Dings magnetic separator, il Metal Ind n s 13:475 N '15

To:413 N 10 Electrical appliances for workshops, il Engineer 119:570 Je 11 '15 Portable magnetic separator outfit, il Elec R & W Elec'n 67:441 S 4 '15; Met & Chem Eng 13:770 O 15 '15

Magnetic surveying
Magnetic survey of the globe. Sci Am 113:
244 S 18 '15

Magnetic surveying—Continued
What the dip needle can and cannot do. C. A.
Cheney, jr. Eng & Min J 100:193-4 Jl 31 '15
What the dip needle can and cannot do.
W. O. Hotchkiss. Eng & Min J 100:363 Ag

Magnetic testing Iron-cobalt alloy, FE<sub>2</sub>CO, and its magnetic properties. T. D. Yensen. il Gen Elec R 18: 881-7 S '15

Magnetic transmission.
Transmission See Automobiles-

Magnetism

agnetism
Application of the electron theory to various phenomena. J. P. Minton. Gen Elec
R 18:287-9 Ap '15
Effect of chemical composition upon the mag-

Effect of chemical composition upon the magnetic properties of steels. W. E. Ruder. Gen Elec R 18:197-203 Mr '15
Magnetic and other properties of electrolytic iron melted in vacuo. T. D. Yensen. pl Am Inst E E Pro 34:237-61 F '15
Magnetic properties of some iron alloys melted in vacuo. T. D. Yensen. il diag Am Inst E E Pro 34:2455-95 O '15
Magnetic studies of mechanical deformation in certain ferromagnetic metals and alloys. H. Hanemann and P. D. Merica. il Am Inst Min E Bul 108:2371-85 D '15
Modern theories of magnetism. G: F. Stradling. J Fr Inst 180:173-98 Ag '15

See also Electricity; Electromagnets; Hysteresis; Magnetic measurements; Magnetic separation of ores; Magnetization

Magnetism, Solar Flammarion talks on the sun. Sci Am 112:146-8 F 6 '15

Magnetization

lagnetic behaviour of iron under alternating magnetization of sinusoidal wave-form. N. W. McLachlan, diags Inst E E J 53:809-

19 Je 15 '15
Magnetization by rotation, S. J. Barnett, Sci
Am S 80:201 S 25 '15
Magnetization curves, J: D. Ball, Gen Elec
R 18:31-5 Ja '15
Magnetization of iron at high flux density with
alternating currents, J. S. Nicholson, Inst
E E J 53:248-57; Discussion, 53:257-63 F 1

Representation of the total losses in iron, due

to alternating magnetization, by an expression of the form  $W=cB^n$ . N. W. McLachlan. Inst E E J 53:350-5 Mr 1 '15

British magneto. Engineer 119:140 F 5 '15 Combined battery and magneto systems. P. M. Heldt. diags Horseless Age 35:312-15 Mr 3

Eisemann brings out magneto for sixes. Il Automobile 32:467 Mr 11 '15 Eisemann flexible magneto coupling, il Auto-mobile 32:33.1 F 18 '15

Eisemann flexible magneto coupling. il Automobile 22:345 F 18 15

Founding magneto industry in France. Automobile 33:51-2+ J1 8 '15

Gear-driven Bosch magneto for Ford. il Automobile 31:1264 D 31 '14

High tension magneto. P. M. Heldt. diags Horseless Age 35:210-12 F 10 '15

High-tension magneto with automatic control. C. J. Morrison. Automobile 32:21 Ja 7 '15

Magneto and coil ignition. P. M. Heldt. diags Horseless Age 35:178-81 F 3 '15

Magneto generator. P. M. Heldt. diags Horseless Age 34:82-2 D 2 '14

Magneto spark vs. battery-coil spark. D. H. Cunningham. Automobile 31:1020-3 D 3 '14

Magneto vs. battery coil—from automobile drivers' viewpoint. C: S. Manierre. Automobile 32:20-1 Ja 7 '15

Magnetos for 1915. il diags Automobile 32: 150-6 Ja 21 '15

Questions on Ford magneto. Automobile 31: 1116 D 17 '14

Recharging magneto magnets. R. J. Everest. il Automobile 32:414-15 Mr 4 '15

Recharging magneto magnets. R. J. Everest. il Automobile 32:414-15 Mr 4 '15
Spark-plug ignition systems. A. H. Israel. diags Power 41:258-60 F 23 '15
Spark timing methods. P. M. Heldt. il diags
Horseless Age 35:274-7 F 24 '15
Special types of magnetos—care and adjustment. P. M. Heldt. diags Horseless Age 35:

Splitdorf announces twelve-cylinder magneto. il diags Automobile 33:19-21 Jl 1 '15 Storage battery charging—magnet recharging. P. M. Heldt. il diags Horseless Age 35:445-6 Mr 31 '15 F. M. Helder. Mr 31 '15 Viring diagram for Remy magneto. diag Horseless Age 35:339 Mr 10 '15

# Manufacture

Eisemann's train-dispatcher system. J. E: Schipper. il plans Automobile 32:580-5 Ap 1 '15

Mahan. ahan, Alfred Thayer, 1840-1914 Admiral Mahan. Sci Am 111:486 D 12 '14

Admiral Mahan, Sci Am 111:486 D 12 '14
Mail handling
C. & A. R. R. adopts automatic mail exchange,
il Eng N 74:669-70 S 30 '15
Expansion of electric-vehicle business in Boston; mail delivery, il Elec R & W Elec'n
67:277-8 Ag 14 '15
Hupp automatic mail exchange system, il
diags Ry R 57:436-40 O 2 '15
Mechanical equipment of the Grand Central
post office, H. T. Wade, il Sci Am 113:232-3
S 11 '15
Opportunity for electric vehicles in mail ser-

S 11 '15 Opportunity' for electric vehicles in mail service. Elec W 65:566-7 F 27 '15 Telegraph traffic and power plant for pneumatic tubes in post offices: abstract. A. B. Eason. Am Soc M E J 37:418-19 Jl '15

Mail order business Kansas City building of Montgomery Ward & co. il plan Arch & Bldg 47:35-40 Ja '15

Maine master plumbers' association Convention in Augusta, Me., on February 9th. Dom Eng 70:244-5 F 20 '15

Maintenance of way master painters' association Abstract of papers and discussions presented at the meeting held November 17-19, 1914, at Detroit, Mich. Ry Age 57:1137-41 D 18 '14 12th annual convention, St. Louis, Oct. 19-21, Ry Age 59:968-9 N 19 '15

Make-ready. See Printing, Practical-Press-

Make-up (printing). See Printing, Practical— Imposition, etc.

Malaria

Malaria and the transmission of R. Ross. Sci Am S 79:50-1 Ja 23 '15 diseases.

Malleable castings. See Iron founding

Malleable iron. See Cast iron

Malt

Acid ratio: a new method for determining the proteolytic strength of germinated grain in technical analysis, C. A. Nowak, J Ind & Eng Chem 7:858-9 O '15

Malt amylase

lalt amylase
Comparison of certain properties of pancreatic
and malt amylase preparations. H. C. Sherman and M. D. Schlesinger. Am Chem Soc J
37:1305-19 My '15
Further experiments upon the purification of
malt amylase. H. C. Sherman and M. D.
Schlesinger. Am Chem Soc J 37:643-8 Mr

Influence of certain acids and salts upon the activity of malt amylase. H. C. Sherman and A. W. Thomas. Am Chem Soc J 37: 623-43 Mr '15

Malting plants
Electricity in malting houses: relative merits
of isolated-plant and central-station service.
il Elec R & W Elec'n 65:1123-8 D 12 '14

Maltose

Structure of maltose and its oxidation products with alkaline peroxide of hydrogen. W. L. Lewis and S. A. Buckborough. Am Chem Soc J 36:2385-97 N '14

Maltose octacetate

tose and of cellose. C. S. Hudson and J. M. Johnson, Am Chem Soc J 37:1276-80 My '15

Man's development illustrated at San Diego; busts depict the earliest known human be-ings. A. H: Wright. il Sci Am S 80:332 N 20

Man, Prehistoric Mankind in the making. W. P. Pycraft. il Sci Am 112:100-1 Ja 30 '15

Man, Prehistoric—Continucd
Prehistoric man and his early efforts to combat disease. T. W. Parry. il Sci Am S 78:365-6

D 5 '14

Management. See Factory management; Foundry management; Machine shop management; Mine management; Office management; Railroads—Management; Scientific management; Shop management

Air-operated chucks and mandrels. E. F. Lake. il diags Mach 21:476-9 F '15 Mandrels for turning parallel surfaces. A. E. Blofield. il Mach 21:340 D '14

Manganese

Analoid method for the determination of man-ganese in steel, iron ore and slag. Met & Chem Eng 12:793-4 D '14

Determination of manganese in ferrovana-dium. W: W. Clark. Met & Chem Eng 13: 155-6 Mr '15 Manganese flour as surface hardener. Foun-

dry 42:490 D '14
Manganese-ore supplies. Eng & Min J 100:
512 S 25 '15

512 S 25 '15
Occurrence and significance of manganese in the seed coat of various seeds. J. S. Mc-Hargue. Am Chem Soc J 36:2532-6 D '14
Supply of manganese ore and ferro-manganese statistics. Met & Chem Eng 13:575 S 1 '15
War affects the manganese industry. Eng & Min J 100:195 Jl 31 '15
War upsets manganese ore industry. Iron Tr R 57:485+ S 9 '15

Manganese bronze. See Bronze

Manganese chloride

Mixed crystals of ammonium chloride with manganese chloride. H. W. Foote and B. Saxton. Am Chem Soc J 36:1695-1704 Ag '14

Manganese dioxide

New method of preparation and some interesting transformations of colloidal manganese dioxide. E. J. Witzemann. Am Chem Soc J 37:1079-91 My '15

Soe J 37:1079-91 My '15

Manganese steel
Are the deformation lines in manganese steel
twins or slip bands? H: M. Howe and A. G.
Levy. 4 pls Am Inst Min E Bul 99:587-600;
103:1467-8 Mr, Jl '15
Composition, uses, and manufacture. J; H.
Hall. diag J Ind & Eng Chem 7:94-8 F '15;
Same cond. Foundry 43:138-9 Ap '15
Designing manganese steel track work. V. Angerer. Ry Age 59:341-2 Ag 20 '15
Improved manganese steel. Mach 21:450 F '15
Manganese steel and the allotropic theory.
A. Sauveur, il Am Inst Min E Bul 93:243949 S '14; Abstract, Iron Tr R 55:1002 N 26
'14; Discussion. Am Inst Min E Bul 100:78790 Ap '15

Manganese-steel castings in the mining industry. W. S. McKee, il diag Am Inst Min E Bul 108:2399-2411 D '15; Same, Iron Tr R 57: 1077-81 D 2 '15
Manganese-steel rails, R. Hadfield, il Engineer

118:564 D 11 '14 Manganese steel special work. Elec Ry J 45: 576-8 Mr 20 '15

Manganese anganese steel track-work specifications. Elec Ry J 45:1118 Je 12 '15

Recent manganese steel crossings. C. L. Haw-kins; E. P. Roundey. Elec Ry J 45:892 My 8 '15

Solid manganese steel crossings in Chicago. il diags Elec Ry J 45:711-12 Ap 10 '15

Steel mill castings: use of manganese steel in heavy rolling mill equipment. G: Tripp, il Iron Tr R 56:49-53 Ja 7 '15

Mangers

Construction onstruction of sanitary mangers in dairy barn at Troy, Pa. il diags Concrete Cem 6:104-6 F '15

Manholes

Drains for manholes, diag Elec W 66:304 Ag

Tile manholes for sewage plants, H. S. Mc-Gee. diag Eng Rec 72:55 Jl 10 '15
Wiring and conduit work at the Panama-Pacific exposition. A. A. Willoughby. il diag
Elec R & W Elec'n 67:365-8 Ag 28 '15

Manila, Philippine Islands

Rapid transit

Manila company submits service brief. Elec Ry J 46:672-3 O 2 '15 Traffic count in Manila. Elec Ry J 46:395 S

Manila rope

Manila rope fastenings, il Eng Rec 70:706 D 26 '14; Abstract, Ind Eng 15:28-9 Ja '15 Manila rope in railway service, F. E. Weise, Ry Age 59:758-9 O 22 '15

Mannose pentacetates
Isomeric pentacetates of mannose. C. S. Hudson and J. K. Dale. Am Chem Soc J 37:1280-2 My '15 2 My

Manometers

Measuring high vacuums; abstract. J. W. Woodrow. diags Elec W 65:36-7 Ja 2 '15 Studies of the vapor pressure of solutions; a static method for the determination of the difference between the vapor pressure of solution and that of solvent. J. C. W. Frazer and B. F. Lovelace. diags Am Chem Soc J 36:2439-49 D '14 Will Quizz, jr. il Power 40:845-6 D 15 '14

Mansfield, Ohio

Sanitary affairs

Proposed method of enclosing a stream in re-inforced concrete conduit. C. L. Bushey. diag Eng & Contr 43:126-7 F 10 '15

Mantels

Concrete mantel made with pre-cast units. il diags Concrete Cem 6:138 Mr '15
Detail of old mantel at Evergreen, Baltimore, Md.; measured drawings by Riggin Buckler. Brickb 24:37-8 F '15
Mantel in Crowninshield Devereux house; drawings. Brickb 24:pl 4 Ap '15

See also Fireplaces

Mantles, Gas. See Gas mantles

Manual training Scc also Trade schools

Manufacturers

Liability of machinery manufacturers, A. L. H. Street. Iron Age 95:222-3 Ja 21 '15

Manufacturers, National association of. National association of manufacturers

Manufactures

Census bureau no inquisition. Iron Age 95: 823 Ap 8 '15

Fields of motor application. D: B. Rushmore. Am Inst E E Pro 34:1105-13 Je '15; Discussion. 34:3006-52 D '15

Ston. 34:3006-32 D 15
Ste also Cars; Chemistry, Technical; Confectionery; Cost accounting; Cutlery; Factories; Gas manufacture; Leather; Machinery; Metals; Paper making and trade; Perfumery; Pottery; Prices; Scientific management; Soap; Steel industry; Textile industry and fabrics; Tubes; United States—Manufactures; Waste products

Manufacturing expense distribution. N: T. Ficker. Eng M 49:321-6, 553-9, 862-71; 50: 58-64, 254-61, 390-400 Je-JI, S-D '15 What constitutes overhead. E. H. Fish. Eng M 49:488-97 Jl '15

Manuscripts, Preparation of
Preparation of copy. F. H. Teall. Inland Ptr
56:381-2 D '15

Map drawing. See Topographical drawing Maple

Commercial uses of sugar maple. H. Maxwell, il Am For 21:1022-30 N '15

Sugar maple; identification and characteristics. S. B. Detwiler, il Am For 21:1019-22 N

Maple sugar

Maple sugar making. il Am For 21:1031-2 N '15

First complete official map of New York city. il Eng Rec 71:666-7 My 22 '15

Lettering land sections for federal valuation maps. L. M. MacArthur. Eng Rec 72:490 O 16 '15

Maps — Continued

Lettering land sections for federal valuation maps. L. W. Duffee. Eng Rec 71:814 Je 26

'15
Mammoth new map of the city of New York.
Eng N 73:991-2 My 20 '15
Maps and map making. T: H. Holdich. Sci
Am S 79:38-9 Ja 16 '15
New York city's twenty-five foot map. C: W.
Person. il Sci Am 112:375 Ap 24 '15
Outgrowths of letterpress; modern mapmaking. G: Sherman. il Inland Ptr 55:321-7 Je
'15

See also Railroads-Maps; Relief maps; Road maps

Maps, Railroad. See Railroad maps

Marage, René, 1859-

hotographing speech; some recent investigations by Dr. Marage. J. Boyer, il Sci Am 112:607-8 Je 19 '15

Electrical equipment of the Vermont marble company. J: Liston. il Gen Elec R 18:1015-25 N '15

Electricity in marble quarrying, il Elec R & W Elec'n 67:963-6 N 27 '15

Marcy ball mill Description. diag Eng & Min J 100:147 Jl 24 '15

Margins (printing)
Margins. J. L. Frazier. Inland Ptr 55:65-8 Ap

Marine boilers. See Boilers, Marine Marine borers. See Borers (animals)

Marine draftsmen, American society of. See American society of marine draftsmen

American society of marine draftsmen

Marine engineering
Defects in installations of marine machinery
and how they were remedied. S. Evans. diags
Int Marine Eng 20:507-9 N '15
Latest developments in marine electrical engineering. H. A. Hornor. Int Marine Eng 20:
201-3 My '15
Marine engineering in 1914. Engineer 119:9, 11
Ja 1 '15
Some hazardous experiences at sea. Int
Marine Eng 20:271-3 Je '15

Marine Eng 20:2117-3 Je 15

Nee also Boilers, Marine; Diesel engines,
Marine: Diving, Submarine: Electricity on
ships; Gas and oil engines, Marine; Marine
engines; Naval architecture; Propellers;
Ship propulsion; Shipbuilding; Steam turbines, Marine

#### Study and teaching

Questions and answers for marine engineers. See monthly numbers of International marine engineering

Marine engines

arine engines
Interesting change in twin screw steamer.
D. Sawyer, Int Marine Eng 20:176-8 Ap '15
Lake passenger steamer Noronic, diags Int
Marine Eng 20:431-5 O '15
Relative advantages of turbines, Diesel engine and reciprocating steam engine drive.
Int Marine Eng 20:223 My '15; Same. Sci
Am S 80:86 Ag 7 '15

Size of inboard bearings, proper design of crossheads and faults of lubricating systems. Int Marine Eng 19:566-7 D '14

Power 41:191 F 9 15

Submarine power plant. A. Hoar. il Sibley J 30:59-63 N '15

Superheated steam in torpedo-boat engines. W. H. Miller. Sci Am 113:33+ J1 3 '15

Thermodynamics of the marine engine: abstract. J: F. Wentworth. Int Marine Eng stract. J: J 20:17 Ja '15

See also Boilers, Marine; Diesel engines, Marine; Gas and oil engines, Marine; Marine engineering; Ship propulsion; Steam engines; Steam turbines, Marine

#### Repair

Handy kinks for the engineer. Int Marine Eng 20:133-4 Mr '15 Valve-spring jams pump-piston. diag Int Marine Eng 20:40 Ja '15

Marine terminals. See Terminals

Maritime law
Freedom of the seas. Sci Am 113:392 N 6 '15
Light on the seamen's bill. Sci Am 113:58 Jl
17 '15

Market buildings
Large market building at Worcester, Mass. il plans Brickb 24:191-2 Ag '15
Pittsburgh's new market house. il Munic J 39:506 S 30 '15
Plumbing system of public market station. il plan Metal Work 84:555-7 O 29 '15

Markets, Municipal

Baltimore's municipal markets; statistics. Munic J 39:659 O 28 '15

Munic J 39:659 0 28 '15 Chattanooga's municipal markets. il Munic J 38:12-13 Ja 7 '15 New public markets in New York. il plans Munic J 38:587-90 Ap 29 '15 Portland's permanent market. H. M. White, il Munic J 39:508 S 30 '15

Marquise (architecture)

Marquise and its design. J: T. Fallon. il Arch Rec 38:555-61 N '15

Canals of Mars. W: H. Pickering. Sci Am 113:249 S 18 '15

Martin, Pierre-Emile, 1824-1915 Sketch. Sci Am S 79:407 Je 26 '15

Martynia

Composition of the seeds of martynia Louisiana. E. H. S. Bailey and W. S. Long. J Ind & Eng Chem 7:867-8 O '15

Marx, Charles David, 1857-President of the Am. Soc. C. E. C: B. Wing. por Eng N 73:386+ F 25 '15

Marysville, Ohio

#### Sewerage

Sewage-treatment plant; screening, two-story sedimentation tanks, crushed-stone contact beds and intermittent sand filters. E. D. Barstow. Eng Rec 72:636-7 N 20 '15

Masonic temples

Masonic temple, Pittsburgh, Pa. il Arch & Bldg 47:289-94 Ag '15

Masonry

Dry masonry walls for highway embankments, il Eng Rec 70:687 D 26 '14 Kensico dam construction in 1914. W. F. Smith. il plan Eng N 73:966-8 My 20 '15

also Arches; Bricklaying; ng; Concrete construction; Bricks:

Building; Dams: Foundations; Plaster and plastering

Mason's chutes
Pattern for construction of mason's chute.
diags Metal Work 83:921-2 Je 25 '15 Massachusetts gas and electric light commis-

sion

30th annual report, map Elec W 66:155 Jl 17

Massachusetts institute of technology

Concrete dome for the new Technology buildings. il Eng N 74:385-6 Ag 26 '15
Course which gives broad training in business and economics. Eng Rec 72:323-4 S 11 '15
Design and construction of Massachusetts institute of technology buildings. S. E. Thompson. il diags plan Concrete Cem 7:14-19 Jl '15; Same. Eng & Contr 43:513-18 Je 9 '15; Same cond. Eng Rec 71:748-50 Je 12 '15 15

New Technology laboratory plans announced, plans Eng N 74:340-1 Ag 19 '15

Pile tests indicate type of substructure for Technology buildings. C: T. Main. il Eng Rec 72:235-8 Ag 21 '15

Power-plant equipment. Elec R & W Elec'n 67:854 N 6 '15; Same. Power 42:752-3 N 30 '15 Preparatory school and after. Eng Rec 71:191

F 13 '15 Scientific aeronautic research. J. (saker. il Sci Am S 79:364-5 Je 5 '15 C. Hun-

Massachusetts state association of plumbers Annual convention, Boston, April 20. Dom Eng 71:133-5 My 1 '15

Massage

Massage in the after-treatment of the wounded. J. B. Mennell. Sci Am S 80:358 D 4 '15

Master boiler makers' association

aster boller makers' association
9th annual convention, Chicago, May 25-29.
Ry Age 58:1129, 1165-9 My 28-Je 4 '15
9th annual meeting, Chicago, May 25-28. Ry
Age (Mech ed) 89:309-17 Je '15
9th annual convention, Chicago, May 25-28.
Ry R 56:731-4 My 29 '15

Master car and locomotive painters' association 46th annual convention, Detroit, Mich., Sept. 14-16. Ry Age 59:565-8 S 24 '15

th annual convention, Detroit, Mich. 14-16. Ry Age (Mech ed) 89:539-42 O

Master car builders' association
Committees. Ry R 57:502-3 O 16 '15
49th annual convention, Atlantic City, June
14-16. Elec Ry J 45:1163-4 Je 19 '15
49th annual convention, Atlantic City, June
14. Ry R 56:832-42 Je 19 '15
President's address. D. F. Crawford. Ry R
56:827-8 Je 19 '15

Master mechanics' association, American railway. See American railway chanics' association

Master plumbers, National association of. National association of master plumbers

Master steam and hot water fitters, National association of. See National association of master steam and hot water fitters

Mastication

Mastication and food utilization. Sci Am S

Utilization of ingested protein as influenced by undermastication and overmastication, L. F. Foster and P. B. Hawk, Am Chem Soc J 37:1347-61 My '15

Mastodon

New mastodon. Sci Am S 80:259 O 23 '15

Masts. See Towers, Steel

Mathematical instruments

See also Calculating machines; Slide rule

Mathematics

Astronomical and mathematical research.

Prof. Schlesinger. Sci Am S 79:168 Mr 13 '15'
Mathematical coincidences. A. J. Lotka. Sci
Am 113:210 S 4 '15'

Am 113:210 S 4 '15 Mathematical coincidences, M, Mott-Smith, Sci Am 113:379 O 30 '15 Moment of inertia of a rectangle by element-ary method, W: H, Gravell, Eng N 73:1073 Je 3 '15 Where the mathematician could aid the as-tronomer, F, Schlesinger, Sci Am S 80:31-2

See also Arithmetic; Astronomy; Calculating machines; Mechanics; Mensuration; Metric system; Multiplication; Numbers; Numerals; Surveying

Formulas

Methods of approximate integration. W. Whited. Eng N 73:840-2 Ap 29 15 Model experiments and the forms of empirical equations. E. Buckingham. Am Soc M E J 37:531-2; Discussion. 37:532-4 S '15

Matter. See Atomic theory; Atoms; Capillarity; Chemistry; Compressibility; Dissociation; Dynamics; Elasticity; Electrons; Force and energy; Ions; Physics; Radioactivity; Specific gravity

Mattresses (hydraulic engineering). See Rivers -Regulation

Mauna Loa

otes from a volcano laboratory; personal documents in the case of Kilauea and Mauna Loa. T. A. Jaggar, jr. il Sci Am S 80:214-17 O 2 '15

Maxicator

Demand indicators: maxicator and printometer types. il Munic J 38:906 Je 24 '15

Maxim, Hudson, 1853-Sketch, por Eng M 50:201 N '15

Mazda lamp. See Electric lamps, Tungsten

Meadville, Pennsylvania

Streets

Paving work in Meadville. B. F. Miller, jr. Munic J 37:804 D 3 '14

Measurement. See Area measurement; Electric measurement; Gages; Gas measurement; Gas meters; Liquid meters; Measuring instru-

ments; Mensuration; Meters; Micrometers; Pitot tube; Slide rule; Steam flow; Steam meters; Stream flow; Stream measurement; Surveying; Temperature—Measurement; Water flow; Water measurement; Water meters; ter flow; Water measur Weights and measures

Measurement of distances in war. A. Keller. il diags Sci Am S 79:324-5 My 22 '15

Measurements, Magnetic. See Magnetic measurements

Measures. See Weights and measures

Measuring instruments

Fine measuring tools for machinists, il Sci Am S 80:28 Jl 10 '15

Nee also Interferometer; Micrometers: Slide rule; Square (instrument)

supply of the United States. Sci Am Meat

Mechanical draft

lechanical draft

Core-oven mechanical draft installation. il
diag Iron Age 96:1163-4 N 18 '15

Fan drafting as applied to locomotives. H. B.
MacFarland. il diags Ry Age 57:1119-22 D 18
'14: Same cond. Ry Age (Mech ed) 89:6-9 Ja
'15; Abstract. Am Soc M E J 37:27-8 Ja '15;
Abstract. Ry R 56:289-90 F 27 '15

Mechanical draft and smoke prevention. T:
Tait. Dom Eng 73:232 N 20 '15

Mechanical draft and the évasé stack. A. M.
de Bellis. diags Eng M 49:525-34 Jl '15
Notes on fans. A. A. Potter and S. L. Simmering. Power 41:816 Je 15 '15

See also Ployer systems: Flowers: Fans.

See also Blower systems; Blowers; Fans, Mechanical

Mechanical drawing
Drafting room reforms, E. H. Fish, diags Eng
M 48:752-5 F '15

M 48:162-5 F '15 Isometric drawings. D. A. Hampson. diags Power 41:785 Je 8 '15 Method of drawing an ellipse. A. W. Schoof. diags Mach 21:496-7 F '15 Suggestions for reading working drawings. F. West. il diags Foundry 43:464-6 N '15

See also Architectural drawing; Drafting room practice; Drawing instruments; Geometrical drawing; Graphic statics; Perspec-

Mechanical engineering

lechanical engineering at the Panama-Pacific international exposition. G. W. Dickie. il Am Soc M E J 37:592-600 O '15

Progress in the field of mechanical engineering during recent years. W. F. Durand. Am Soc M E J 37:viii-x O '15

See also Automobile engineering; Boilers; Electric engineering; Engineering; Engines; Friction; Hydraulic engineering; Joints; Locomotives; Lubrication and lubricants; Machine shop practice; Machine tools; Machinery; Marine engineering; Mechanical draft; Mechanics; Power plants; Power transmission; Steam engineering; Steam engineering

Mechanical engineers, American society of See American society of mechanical engineers

Mechanical engineers, Institution of. See Institution of mechanical engineers

Mechanical handling

Handling iron and cinder at the blast furnace. J. E. Johnson, jr. il diags Met & Chem Eng 13:85-9 P 15

Handling materials in manufacturing plants. R. L. Streeter: il diags Eng M 50:222-46, 401-28 N-D '15

Plant for handling scrap on the Boston & Albany. il diags Ry Age 58:745-6 Ap 2 '16

Portable geared hand-power hoist, diag Eng N 74:864 O 28 '15; Eng & Min J 100:733 O 30

Scrap-handling plant of Boston & Albany rail-road, il Eng Rec 70:651-2 D 12 '14

See also Ash handling; Blast furnaces—Charging; Coal handling; Concrete handling; Conveying machinery: Cotton cranes, derricks, etc.; Dumping appliances; Electric trucks in factories, freight terminals, etc.; Freight handling; Lifting magnets; Loading and unloading; Lumber handling; Mail handling; Ore handling; Rail handling; Slings and hitches; Trucks

Mechanical movements

Theorything machine that walks, il diag Sci

Excavating machine that walks. il diag Sci Am 113:68 Jl 17 '15 Stop motion for moving picture machines. W. B. Morton, diags Sci Am S 79:396-7 Je

geometric properties of articulated levers. S. D. Mott. Sci Am S 80:77 Jl 31 '15 Suggestions

Mechanical stokers. See Stokers, Mechanical

Mechanical theory of life
Is the organism a thermodynamic mechanism.
J. Johnstone. Sci Am S 80:82-3, 106-7 Ag
7-14 '15

Mechanics

Analogies between electricity and mechanics. W. S. Franklin. Met & Chem Eng 13:317 My '15

Power required to stop an automobile. W. T. Francis, Sci Am S 78:406 D 26 '14

See also Aeronautics; Deformations (mechanics); Dynamics; Elasticity; Engineering; Fluids; Force and energy; Friction; Gases; Graphic statics; Hydraulics; Load (mechanics); Machinery; Motion; Power; Pulleys; Steam engines; Strains and stresses

Mechanics' liens
Right to lien for plans not used. A. L. H.
Street. Bldg Age 37:57-8 Mr '15

Mechanotherapy
Mechanics of convalescence; methods of hastening the cure of German wounded soldiers.
W. Bannard. il Sci Am 112:404 My 1 '15

Mediation and conciliation, Board of. See United States-Board of mediation and conciliation

Medical examinations. See Physical examinations

Medical folk-lore

Curious cures. I. F. Hapgood. Sci Am S 80:331 N 20 '15

Medical instruments and apparatus

pparatus for mechanical administration anaesthetics. il Sci Am 113:471+ N 27'1 Apparatus

Medical research Scientific research in the public health service. Sci Am 112:284 Mr 27 '15

Medical reserve corps. See United States-Army

Medicine, Military

frost-bite. L. Smith. Sci Am S 80:357-8 Trench fr D 4 '15

See also Surgery, Military

Medicine, Primitive

Medicine of the Old Testament. S. B. Blakely. Sci Am S 80:70-1, 90 Jl 31-Ag 7 '15

Medieval architecture. See Architecture, Medieval

Meerschaum

Meerschaum deposits of New Mexico. F. V. Bush. il map Eng & Min J 99:941-3 My 29

Megrim. See Headache

Mellon institute. See Pittsburgh university. Mellon institute

Melting points

Determining the melting points of asphalts.
J. G. Miller and P. P. Sharples, Eng & Contr.
43:87-8 Ja 27 '15
Melting point of copper alloys. H. W. Gillett.
and A. B. Norton. Metal Ind n s 13:228 Je '15
Melting points of chemical elements and other standard temperatures. Met & Chem Eng.
13:302 My '15

Memphis, Tennessee

Bridges

Substructure for new Memphis bridge, M. B. Case, il Eng Rec 71:518-20 Ap 24 '15; Same, Ry Age 58:877-81 Ap 23 '15; Same cond. Ry R 56:554-6 Ap 24 '15; Same cond. Eng N 73:792-3 Ap 22 '15

Politics and government

Commission and city manager forms of government. H. H. Rumble, R. W. Peatross and J. E. Burke. Munic Eng 49:53-4 Ag '15

New I. C. station and track elevation at Mem-phis. il plan Ry Age 58:179-81 Ja 29 '15

Mendelism

Heads and tails and heredity, E. Borel, il diags Sci Am S 78:403-5 D 26

Mensuration

ensuration
Capacity of cylindrical tanks; a rapid means of determining the contents of tanks of all of the usual lengths and diameters. Horseless Age 36:76 J1 21 '15
Table of angular deflections in decimals of feet. C. H. Eiffert. Eng N 74:1087 D 2 '15

See also Area measurement; Metric system; Surveying; Weights and measures

Mental diseases

Pathology of mental disorders. E. ( Am S 79:306-7, 335-6 My 15-22 '15 See also Nervous system-Diseases

Mental tests. See Ability tests

Menu cards Specimens. Inland Ptr 55:64a-64h Ap '15

Mercantile law. See Commercial law

Mercaptopyrimidines

Researches of pyrimidines: alkylation of 2-mercaptopyrimidines. T. B. Johnson and H. W. Haggard. Am Chem Soc J 37:177-83 H. W. Ja '15

Researches on pyrimidines; the alkylation of 2-mercaptopyrimidines. T. B. Johnson and R. C. Moran. Am Chem Soc J 37:2591-7 N '15 Merchant marine. See Shipping-United States

Merchants Human nature and unsuccessful shop management. R. T. Gebler. Metal Work 82:823-4 D

Training and holding competent employes. F. Mappes. Metal Work 82:731-3 D 4 '14

Sec also Business

Mercuric chloride

Association of mercuric chloride in water solu-

ssociation of mercuric chloride in water Solition. G. A. Linhart. Am Chem Soc J 37: 258-74 F '15 ate of reduction of mercuric chloride by sodium formate. G. A. Linhart. Am Chem Soc J 37:70-6 Ja '15 Rate

Mercury

Min E Bul 104:1659-70 Ag '15; Excerpts. Met & Chem Eng 13:927 D 1 '15 Cinnabar in western Nevada. Eng & Min J 100:

668 0 23 "15
Measurement of oxidation potentials at mercury electrodes: the stannic-stannous potential. G: S. Forbes and E: P. Bartlett. Am Chem Soc J 36:2030-40 0 '14
Mercury assay. S. Fischer, jr. diags Met & Chem Eng 12:774 D '14
Mining and reduction of quicksilver ore at the Oceanic mine, Cambria, Cal. C. A. Heberlein. diags Am Inst Min E Bul 98:497-504 F '15: Discussion. 101:1139-41 My '15
New Almaden quicksilver mine, R: G. Place. il Eng & Min J 100:465 S 18 "15
Nickel, copper and mercury as affected by the war. J Ind & Eng Chem 7:71-2 Ja '15
Production of quicksilver in the United States in 1914. Eng & Min J 99:68 Ja 9 '15
Recovery of mercury from amalgamation tail-

Recovery of mercury from amalgamation tailing, Buffalo mines, Cobalt. E. B. Thornhill. flow sheet Am Inst Min E Bul 104:1653-7 Ag '15; Abstracts. Met & Chem Eng 13:330-1, 873, 896 My, N 15-D 1 '15; Discussion. Am Inst Min E Bul 108:2455 D '15

See also Amalgams

Mercury boilers. See Boilers, Mercury

Mercury compounds Salts of the ha

alts of the halogenoacetic acids, W. G. Bateman and D. B. Conrad. Am Chem Soc J 37:2557-60 N '15

vapor rectifier. See Electric current Mercury rectifiers

Mergelynck museum. See Ypres, Belgium

Meroë

Meroë the royal city of Ethiopia. Sci Am S 79: 98 F 13 '15

Merriman, Mansfield, 1848-Head of American society for testing materi-als. por Iron Tr R 56:1331 Je 24 '15

Mesabi range. See Iron mines and mining-Minnesota.

Mesothorium

Monazite, thorium, and mesothorium. K. L.

Kithil. bibliog flow sheet U S Bur Mines
Tech Pa 110:1-30 '15

Messhouses. See Construction camps

Mestre, Italy

Bridges

Design and construction of provincial high-way bridge at Mestre, Italy. A. M. Wolf. diags Concrete Cem 6:294-6 Je '15

Metabolism

Dynamic conception of the organic individual. Sci Am 113:120 Ag 7 '15 Pathology of mental diseases. E. Goodall. Sci Am S 79:335-6 My 22 '15

Metal cleaning

Removing grease by electricity; the modern way to prepare metal articles for plating operations. T: Brown. Metal Ind n s 13:192-4 Мy

Metal coating

Development and perfection of Schoop metal spray, il Sci Am 112:362+ Ap 17 '15

Metal spray processes in engineering and art; with cost tables. J: Calder. il diags Am Soc M E J 37:378-83 JI '15; Abstract. Eng M 49:924-6 S '15

M E J 3':3'8-83 Jl '15; Abstract. Eng M 49:924-6 S '15
Metal spraying process for coating ornamental products. il Concrete Cem 6:56 Ja '15
Metal spraying process of protecting metal against corrosion. il diag Eng & Contr 42' 326-7 S 30 '15
Method of coating iron or steel with lead. Am Gas Light J 103:292 N 8 '15
Plating by impact; Jenkins process. Am Gas Light J 103:253 O 18 '15
Plating by shooting. il Sci Am 113:84 Jl 24 '15
Producing protective coatings by the Schoop metal spraying process. R. K. Morcam. diags Horseless Age 34:827-8 D 2 '14
Protective coatings for metal. H. B. C. Allison. Gen Elec R 18:878-80 S '15; Same. Eng & Contr 44:263-4 O 6 '15
Schoop metal-spraying pistol. R. K. Morcom. Eng & Min J 100:192 Jl 31 '15
Spray process for the production of metallic coatings. Am Gas Light J 102:28-9 Ja 11 '15
Spraying shrapnei shells, il Iron Age 96:355
Ag 12 '15
Sce also Galvanizing; Plating

See also Galvanizing; Plating

Metal coloring
Metal coloring by the corrosion process.
E. Blassett, jr. Metal Ind n s 13:17 Ja '15
Pullman finish. Metal Ind n s 13:250 Je '15

Metal corrosion. See Corrosion and anti-corrosives; Metal protection

Metal cutting

Cutting aluminum rapidly on a buzz planer, J Fr Inst 180:634 N '15
Cutting tools, il Engineer 119:275-7 Mr 19 '15
Cutting tools, il Engineer 119:275-7 Mr 19 '15
Diagram for determining cutting time, I, Schelbeck, Mach 21:473 F '15
Duplex cold metal cutting-off machine, il Iron Age 95:503 Mr 4 '15
High temperature flames in metal working, H. R. Swartley, jr. Iron Age 96:1122 N 11 '15
Oxy-acetylene welding and cutting equipment, S. W. Miller, il diags Mach 22:85-99 O '15
Profile milling and grinding, E. Lea, il diags Mach 21:821 Je '15

Progress in machine shop methods. E. R. Norris, il Iron Tr R 57:679-82+, 747-50 O 7-14 '15

See also Cutting machinery; Gear cutting; Milling cutters; Oxyacetylene flame; Steel cutting; Thread cutting machines

Metal finishing Carbonia finish, il Am Gas Light J 103:81 Ag 9 '15

See also Grinding and polishing; Metal coloring

Metal lath

Length of life of walls of mortar on metal lath. W. E. Belcher. Eng Rec 71:754 Je 12 '15

Metal plate floors. See Floors, Metal plate

Metal prices. See Metal trade

Metal protection

Aluminum alloys as surface protection for metals subject to high temperatures. Eng N 72:1123 D 3 '14

Calorizing: a protective treatment for metal. H. B. C. Allison and L. A. Hawkins, il Gen Elec R 17:947-51 O '14; Same. Sci Am S 78: 341-2 N 28 '14; Same cond. Am Gas Light J 101:309-10 N 16 '14; Same cond. Eng M 48: 265-7 N '14; Same cond. Met & Chem Eng 12:730 N '14; Same cond. Iron Age 94:1386-7 D 17 '14; Same cond. Metal Work 82:843-D 25 '14

D 25 '14'
Calorizing metals, W. E. Ruder, Met & Chem Eng 13:325 My '15 at Reading, Mass., and Baltimore, Md. F. C. Perkins. il Eng & Contr 44:32 Jl 14 '15
Corrosion of iron. L. C. Wilson. Eng M 48: 849-58; 49:58-66, 202-10 Mr-My '15
Corrosion of steel wharves at Kowloon: abstract. S. H. Ellis, diags Am Soc M E J 37:123-4 F '15
Cunite concrete encasement diags by P. 56:

37:123-4 F '15
Gunite concrete encasement, diags Ry R 56: 129-30 Ja 23 '15
New method of coating iron or steel with lead. Iron Age 96:241 Jl 29 '15
Paint protection of the Panama canal lockgates. H: Goldmark, Eng N 72:1227 D 17 '14
Paint vehicles as protective agents against corrosion; with discussion. M. Toch. il J Ind & Eng Chem 7:510-14 Je '15
Paints for steel structures. Iron Tr R 56:1062-3 My 27 '15
Prepared paints for metal surfaces. H: A. Gardner. Ry Age (Mech ed) 89:513-14 O '15; Same. Eng & Contr 44:346-7 N 3 '15
Preservative coatings for steel Iron Age 96:23 Jl 1 '15
Preventing corrosion of steel substructure of

Preservative coatings for steel from Age 20:22 Jl 1 '15

Preventing corrosion of steel substructure of the Cortlandt street ferry terminal of the Pennsylvania in New York city with gunite. il Ry Age 58:852 Ap 16 '15

Protection of iron and steel by paint films. N. A. Dubois, il Sci Am S 77:85-6 F 7 '14; Same abr. Sci Am S 79:160 Mr 6 '15

Protection of iron and steel. J. W. Gibbons. il Ry Age (Mech ed) 89:580-1 N '15

Protection of metal structures; with discussion. F: H. Fay. il diags Eng Soc W Pa 31: 115-93 Mr '15; Excerpt. Ry R 57:154 Jl 31 '15

Protection of metals against electrolysis, weathering, chemical fumes, etc. M. Toch. il Sibley J 30:54-5 N '15

Protective coatings for iron and steel. E. P. Later. Foundry 42:497-8; 43:35+ D '14-Ja '15

Protective coatings for line structure and equipment. R. D. Coombs. Elec W 65:730 Mr 20'15

Protective coatings for metal, H. B. C. Allison. Gen Elec R 18:878-80 S '15; Same. Eng & Contr 44:263-4 O 6 '15

See also Corrosion and anti-corrosives; Galvanizing; Metal coating

Bibliography

Bibliography of metal corrosion and protection. Eng Soc W Pa 31:193-222 Mr '15

Metal spray. See Metal coating

Metal trade

Australian metal contracts. L. H. Quin. Iron Age 96:1050-1 N 4 '15 Buying and selling of ores and metallurgical products. C: H. Fulton. U S Bur Mines Tech Pa 83:1-42 '15; Excerpt. Met & Chem Eng 13:640-1 S 15 '15; Excerpt. Sci Am S 80:180

S 18 15
California metal output, 1914. Eng & Min J
100:529 S 25 '15
Course of metal prices since 1879—annual
averages: chart. Eng & Min J 99:50 Ja 9 '15
Doing without Europe. Sci Am 112:128, 157+
F 6-13 '15

German metal prices. Engineer 118:537 D 4

Germany's foreign interests in metals. Eng & Min J 99:339-40 F 13 '15
Metal market features of 1914. C: Lundberg. Iron Age 95:11-12 Ja 7 '15
Metal prices in 1913 and 1914, monthly averages: chart. Eng & Min J 99:49 Ja 9 '15
Metal statistics from the United States geological survey. Metal Ind n s 13:334 Ag '15
Metal, tin-plate and sheet prices for seventeen years. Iron Age 95:24-24a Ja 7 '15
Metals in 1914 from the New York Evening post's annual financial review. J Ind & Eng Chem 7:157-8 F '15

Metal trade — Continued

National metal trades association meeting.

Iron Age 95:890-3 Ap 22 '15

Nevada metal production, 1914. Eng & Min J

100:530 S 25 '15

Nickel, copper and mercury as affected by the war. J Ind & Eng Chem 7:71-2 Ja '15
Production of minerals and metals in 1914. Eng & Min J 99:45-77 Ja 9 '15
Retrospective review of 1914—outlook for 1915. Metal Ind n s 13:23-4 Ja '15
Steady progress in co-operation as indicated by reports at the annual convention of the National metal trades association. Iron Tr R 56:825-30 Ap 22 '15
War and our chemical industries. C. H. White. J Ind & Eng Chem 7:62-3 Ja '15
War and our metals. L. O. Kellogg. Eng M 49:18-27 Ap '15

See also Copper industry and trade; Iron industry and trade; Lead industry and trade; Scrap metal; Steel industry and trade; Zinc industry and trade

Metal trades association, National See National metal trades association

Metal waste

Flotation of Joplin-Galena slimes. G: Belchic and G. L. Allen. Met & Chem Eng 13:847 N

Melting aluminum chips. H. W. Gillett. Metal Ind n s 13:417-18 O '15; Same. Foundry 43: 462-3 N '15; Same. Iron Tr R 57:942-3 N 11

Reclaiming brass sweepings, A. W. Lemme. Iron Age 95:946 Ap 29 '15; Same. Foundry 43:191-2 My '15; Same. Metal Ind n s 13: Iron Age 95: 43:191-2 My My '15

Reclaiming eclaiming metals from cinder: Standard equipment company crusher, il diag Foundry :327-8 Ag

43:327-8 Ag '15
Reclamation of magnalium from turnings. J:
Coulson. Metal Ind n s 13:455-7 N '15; Abstract. Am Soc M E J 37:655-6 N '15
Refining of zinc waste, L. J. Krom. il diags
Metal Ind n s 13:281-3 Jl '15
Treatment of waste material containing silver.
R. J. Marsh. Metal Ind n s 13:314-17 Ag '15 See also Scrap metal; Tailings

Metal work

See also Cutlery; Dies; Ironwork; Machine tools; Metal coloring; Metal working plants; Plating; Punching machinery; Sheet-metal work; Solder and soldering; Welding

Metal work, Artistic

offluence of style on the art metal work of modern times. A. F. Saunders. il Metal Ind n s 12:18-20, 389-90; 13:18-19, 324-5 Ja, S 14, Ja, Ag 15

Metal workers

Educating sheet metal workers' apprentices. O. E. Cluss. Metal Work 83:827 Je 4 '15

Metal working machinery
April exports show \$2,000,000 increase or 150
per cent. Iron Age 95:1346-7 Je 17 '15
Modern sheet metal machinery plant. il plans
Metal Work 83:127-9 Ja 15 '15
New sheet metal forming machine. il diag
Iron Age 96:877 S 9 '15
Power flanging brake for sheet metal. il Iron
Age 96:877 O 14 '15
Ryerson quintuple punching, shearing and
coping machine. il Ind Eng 15:53 F '15
Wor revives machinery exports Iron Age 95:

War revives machinery exports, Iron Age 95: 182 Ja 21 '15

See also Machine tools; Wire-working ma-

chinery

Metal working plants
Present practise in the use of tungsten filament lamps for the lighting of metal working plants; with discussion. A. L. Powell and R. E. Harrington. il illum Eng Soc 9: 814-38 no 8 '14

See also Metallurgical plants

Metallography
Alumina in steel. G: F. Comstock. il Met &
Chem Eng 13:891-5 D 1 '15

Are the deformation lines in manganese steel twins or slip bands? H: M. Howe and A. G. Levy. 4 pls Am Inst Min E Bul 99:587-600; 103:1467-8 Mr, Jl '15

Brass and bronze—offsprings of copper. J. E: Schipper. il map Automobile 33:315-19 Ag 19

Schipper. il map Automobile 33:315-19 Ag 19
'15
Carburization and heat-treatment. J. G. Ayers, jr. il Mach 22:17-23 S '15
Detection of burning in steel. J. E. Stead. il Iron Tr R 57:843-4 O 28 '15
Determination of grain size in metals. Z. Jeffries. Am Inst Min E Bul 108:2359-69 D '15
Effect of titanium alloys on steel. G: F. Comstock. il Iron Tr R 57:391-5+ Ag 26 '15
Formation of the oxidized ores of zinc from the sulphide. Y. T. Wang. il Am Inst Min E Bul 105:2007-12 S '15
High speed tool steels. F: C. A. H. Lantsberry. il Iron Age 96:238-41 Jl 29 '15
How sulphides may exist in steel ingots. J. O. Arnold and G. R. Bolsover. Iron Tr R 57:737-8 O 14 '15; Discussion. G. F. Comstock. Iron Tr R 57:594+ N 4 '15
How to detect phosphorus in steel. W. T. Stead. il Iron Tr R 57:398-90 N 18 '15
How to select etching reagents. O. F. Hudson. il Iron Tr R 57:216-20 Jl 29 '15
Metallographic grinding and polishing machine. il Iron Age 95:1164 My 27 '15
Metallography of copper. W: Campbell. Met & Chem Eng 13:721 O 15 '15
Metallography of German silver. F. C: Thompson. Met & Chem Eng 12:785-6 D '14
Micrographic inspection of steel: what the United States navy has done in fixing causes of failures. il Iron Age 95:292-3 F 4 '15
Microscopic tests of steel; German investigations at Krupps. B. Strauss. Iron Age 95:

Microscopic tests of steel; German investiga-tions at Krupps, B. Strauss. Iron Age 95:

Modified iron-carbon diagram. E. A. Sperry. Met & Chem Eng 13:469-71 Ag '15
Preparation of metal specimens for metallographic tests, il Met & Chem Eng 13:400-1
Je '15

Radiography of metals. W. P. Davey. il Am Inst Min E Bul 104:1515-25 Ag '15; Same. Gen Elec R 18:795-800 Ag '15; Same cond. Iron Age 96:522-4 S 2 '15

Reagent for macroscopic etching, J. L. Jones, il Iron Tr R 56:1303-4 Je 24 '15; Abstract. Eng M 49:919 S '15

Eng M 49:919 S '15
Recent developments in cast-iron manufacture,
J. E. Johnson, jr. J Fr Inst 179:59-93, 171-200
Ja-F '15; Discussion. 179:200-13 F '15
Recent progress in metallography. W: Campbell, bibliog Sch Mines Q 36:249-79 Ap '15
Researches in annealing malleable castings.
O. W. Storey, il Foundry 42:474-8 D '14
Steel for steering knuckles. E. F. Lake, il
Iron Tr R 56:611-12+ Mr 25 '15
Steel—its pathology. J. E: Schipper, il diags
Automobile 32:611-15, 660-3+, 706-8+ Ap 8-22 '15
Structure and hysteresis loss in medium-car-

22 '15
Structure and hysteresis loss in medium-carbon steel. F. C. Langenberg and R. G. Webber. il Am Inst Min E. Bul 98:291-300 F '15: Same. Iron Age 95:506-8 Mr 4 '15; Same. cond. Iron Tr R 57:576-7 S 23 '15
Surface decarburization of steel. J. G. Ayers, jr. il Iron Tr R 56:1305-6+ Je 24 '15; Same. Iron Age 96:5-7 Jl 1 '15

See also Alloys; Iron; Steel

# Bibliography

Recent progress in metallography, bell. Sch Mines Q 36:252-79 Ap '15 W: Camp-

Metallurgical analysis
Adjustment of the direct electric lighting current to electro-analysis. E. J. Kauffman.
plan Met & Chem Eng 13:524-5 S 1 '15
Analysis of spelter: report. J Ind & Eng Chem
7:547-8 Je '15

Electro-analysis of the second group metals; abstract. E. P. Schoch and D. J. Brown. Eng & Min J 100:521 S 25 '15; Same. Met & Chem Eng 13:568 S 1 '15

See also Assaying; Iron-Analysis; Steel-

Analysis

Metallurgical apparatus
Arizona copper co.'s Dorr thickener. D:
il diag Eng & Min J 100:131-4 Jl 24 '15 Cole.

Callow pneumatic process of flotation, il plan Met & Chem Eng 13:571-2 S 1 '15

Device to introduce deoxidants into molten metal, diags Iron Age 95:844 Ap 15 '15

Metallurgical apparatus -- Continued

etallurgical apparatus—Continued
Precipitating apparatus for use in cyaniding,
plan Eng & Min J 99:1079 Je 19 '15
Simmonds' retort-discharging machine, il Eng
& Min J 99:419-50 Mr 6 '15
Siphons on solution samplers, diags Eng &
Min J 99:863 My 15 '15
Use of hydrometallurgical apparatus in chemical engineering, J: V. N. Dorr, il diags J Ind
& Eng Chem 7:119-30 F '15; Same, Met &
Chem Eng 13:55-9, 91-8 Ja-F '15

See also Concentrating tables; Dorr agitators; Trent agitators

Metallurgical patents

Laist roasting patents. diags Eng & Min J 99:282-4 F 6 '15

See also Alloys-Patents

Metallurgical plants
Anaconda leaching and acid plants. E. P.
Mathewson. il plans Eng & Min J 99:723-7 Ap 24 '15

Design of modern copper plants. C: H. Repath, Met & Chem Eng 13:660-1 O 1 '15 Gold milling in California—a comparison. L. A. Palmer. il diag Met & Chem Eng 13:617-24 S

How titanium-aluminum bronze is produced. C. Vickers, il Foundry 43:273-8 Jl '15
Labor and power used in cyanide mills. H. A. Megraw. Eng & Min J 99:312-14 F 13 '15
Mine and metallurgical construction in 1914.
Eng & Min J 99:78-80 Ja 9 '15
New mill of the Daly West mining co., Park City, Utah. L. C. Howard, il plan flow sheet Met & Chem Eng 13:597-602 S 15 '15
Zinc manufacture in the Pittsburgh district; plant of the American zinc & chemical company at Langeloth, Pa. il map Iron Age 95:1064-7 My 13 '15

See also Cyanide plants: Iron works:

See also Cyanide plants; Iron works; Smelting works; Steel works

#### Accidents

Accidents in metallurgical plants in 1913 and 1914. Eng & Min J 100:816 N 13 '15

#### Cost

Building the Tough-Oakes mill. J. A. Baker. il diags Eng & Min J 100:869-74, 915-18 N 27-D 4'15 Cost of mill construction, H. T. Curran. Eng

27-D 4 '15
Cost of mill construction. H. T. Curran. Eng
& Min J 100:345-7 Ag 28 '15; Same. Eng &
Contr 44:266-8 O 6 '15
Tonopah plant of the Belmont milling co.:
construction costs. A. H. Jones. Am Inst
Min E Bul 104:1731-2 Ag '15; Same. Eng &
Min J 100:481 S 18 '15; Abstract. Met &
Chem Eng 13:811-12 N 1 '15

Metallurgists Good advice to consulting metallurgists and others. W. B. Blythe. Met & Chem, Eng 13: 442-3 Jl '15

Metallurgy

Metallurgy

American institute of mining engineers 110th meeting. Met & Chem Eng 13:177-85 Mr '15

Formation and decomposition of sulphates during roasting. B. Dudley, jr. Met & Chem Eng 13:221-6, 303-8 Ap-My '15

Metallurgical temperature chart. W: J. Kiln. Foundry 43:142a Ap '15

Metallurgical treatment of the low-grade and complex ores of Utah. D. A. Lyon, R. H. Bradford, S. S. Arentz, O. C. Ralston, and C. L. Larson. U S Bur Mines Tech Pa 90:1-39 '15

Metallurgical work at the National Metallurgic

Metallurgical work at the National physical laboratory 1914-1915. Met & Chem Eng 13: 583-5 S 15 '15 Metallurgy at International engineering congress. Met & Chem Eng 13:655-62, 721-9 O

Metallurgy in the Coeur d'Alenes, H. A. Megraw, il Eng & Min J 100:827-30 N 20 '15 Progress in metallurgy, J. Douglas, Am Inst Min E Bul 100:768-6 Ap '15

Separation of white metal and gunmetal bor-ings. R. H. Walton and G. T. Bailey. diag Met & Chem Eng 13:204 Ap '15

See also Alloys; Assaying; Blast furnaces; Chemical engineering: Chemistry, Technical; Cyanide process; Electrometallurgy; Electrostatic separation of ores; Filters and filtra-

tion (metallurgy); Flue dust; Flux; Furnaces, Metallurgical; Hydrometallurgy; Magnetic separation of ores; Metallurgical analysis; Metallurgical apparatus; Metallurgical plants; Metallurgical; Metallurgical apparatus; Metallurgical plants; Smelting; Stamp mills; also names of metals, e. g. Aluminum metallurgy, Copper metallurgy, Iron metallurgy, Lead metallurgy, Silver metallurgy, Steel metallurgy, Zinc metallurgy, Zinc metallurgy

#### Exhibitions

o-operative metallurgical exhibit at the Panama-Pacific international exposition. A. E. Wells and G. H. Clevenger. il Met & Chem Eng 13:743-5 O 15 '15 Co-operative metallurgical the

#### Standards

Standardization of metallurgical units. Met & Chem Eng 13:828-9 N 15 '15

American institute of metals annual meeting, Atlantic City. Foundry 43:394-7 O '15 American institute of metals meeting at At-lantic City, Sept. 28. Iron Age 96:819-22 O 7

Behaviour of metals under stress. F. C. A. H. Lantsberry. Engineer 119:68 Ja 15 '15 Conductivity of metals. J. J. Thomson. Sci Am S 80:114-15 Ag 21 '15 Effect of acetylene on metals. Sci Am 113:408 N 6 '15

Electronic theories of the properties of metals. C. H. Lees. Sci Am S 80:320 N 13 '15 Hardening of metals. Am Soc M E J 37:489-90

Hardening of metals. Am Soc M E J 37:489-90 Ag '15
Institute of metals: annual general meeting. Engineer 119:309-10 Mr 26 '15
Institute of metals annual meeting, London, March 18-19. Foundry 43:193-4 My '15
Many carbon-free metals and alloys now available. H. D. Browne. Eng N 74:636-7 S 30 '15
Metastability of metals. A. Vosmaer. Met & Chem Eng 13:535-6 S 1 '15
Method of reducing some metals in crystallized form on glass slips as permanent microscope mounts. J. H. Bowman. il Am Chem Soc J 37:1468-71 Je '15
Munition metals. H. C. H. Carpenter. Sci Am S 80:262-3 O 23 '15; Abstract. Eng M 50:112-13 O '15
Passivity of metals. H. G. Byers and S. C.

Passivity of metals. H. G. Byers and S. C. Langdon, diags Am Chem Soc J 36:2004-11

Properties of metals at higher temperatures; abstract. P. Ludwik. Am Soc M E J 37: 604-5 O '15

abstract. F. Ludwik. Am. 604-5 O '15
Rapid analysis of bearing metals and high-copper content alloys. C. G. Lutts. Met & Chem Eng 13:346-7 Je '15
Weight per cubic foot and per cubic inch.
W. L. Tryon. Foundry 43:222a Je '15

W. L. Tryon. Foundry 43:222a Je'15

See also Alloys; Amalgams; Annealing;
Assaying; Babbitt metal; Chemistry, Inorganic; Corrosion and anti-corrosives;
Foundry practice: Gun metal; Hardening;
Hardness; Metal work; Metallography; Metallurgy; Mines and mineral resources; Ore deposits; Slag; Smelting; Solder and soldering;
Welding; Wire; also names of metals and alloys, e. g. Aluminum, Brass, Bronze, Cobalt, Copper, Gold, Iron, Lead, Manganese,
Mercury, Nickel, Steel, Tin, Zinc

#### Diseases

Fatigue and disease of metals. P. Kreuzpointer. Iron Age 95:950-1 Ap 29 '15 Liberty bell and disease of metals. il Iron Age 95:391-3 F 18 '15; Same. Sci Am S 79: 236-7 Ap 10 '15

Testing

Testing
Brinnell hardness testing of non-ferrous alloys.
V. Skillman. Metal Ind n s 12:423-4 O '14;
Same. Foundry 43:111-12 Mr '15
Comparison of hardness testing apparatus.
Mach 21:364 Ja '15
Endurance of metals under repeated stresses;
some new facts, and a new method of testing. diags Locomotive 30:130-42 Ja '15
Fatigue of copper alloys. E. Jonson. Metal
Ind n s 13:283-4 Jl '15; Same. Eng Rec 72:
22-3 Jl 3 '15; Same, with discussion. Foundry
43:311-12 Ag '15

Metals-Testing -Continued

Metals—Testing—Continued
Finding blowholes with the X-rays. C. H. Tonamy, il diags Foundry 43:455-6 N '15; Same cond. Iron Age 96:1054-5 N 4'15
Magnetic studies of mechanical deformation in certain ferromagnetic metals and alloys. H. Hanemann and P. D. Merica, il Am Inst 'Min E Bul 108:2371-85 D '15
Mechanical properties of metals. F. C. A. H. Lantsberry. Metal Work 82:327 D 25'14
Test pieces for tensile tests. H. Friedmann. diags Metal Ind n s 13:247 Je '15
Metals Estigue in See Fatigue in metals.

Metals, Fatigue in. See Fatigue in metals

Metamorphism (geology)
Observations on contact metamorphic ore deposits, B. Prescott, diags Econ Geol 10:55-69 Ja '15

Metastability. See Allotropy

Meteor mountain, Arizona

line in a meteor-made crater. A. Chapman. il Sci Am 112:70 Ja 16 '15

Meteorites

Mine in a meteor-made crater, A. Chapman. il Sci Am 112:70 Ja 16'15

Meters

Direct-reading volumetric and velocity meter for measuring fluid flow, il Eng N 72:1213

for measuring fluid flow, il Eng N 72:1215 D 17 '14 Levin flow meter and metering flow bend, diags Power 42:372-3 S 14 '15 Rate-flow meter. H. C. Hayes. Am Soc M E J 37:159-64 Mr '15; Discussion. 37:164, 225-6 Mr-Ap '15 Report of the committee on measurement of gas in large volumes, diag Am Gas Inst Pro 9:pt 1, 677-704; Discussion. 705-20 '14 Republic flow meter, diag Power 42:612 N 2 '15; Eng & Min J 100:888 N 27 '15

See also Coal meters; Compressed air meters; Electric meters; Extensometers; Gas meters; Liquid meters; Pitometer; Steam meters; Viscometers; Water meters

Reading

Camera for reading meters. il Am Gas Light J 103:141 Ag 30 '15; Mach 22:75-6 S '15

Meters, Electric. See Electric meters

Meters, Liquid, See Liquid meters

Meters, Steam. See Steam meters

Methane

Influence of temperature and pressure on the explosibility of methane-air mixtures. G. A. Burrell and I. W. Robertson. diag J Ind & Eng Chem 7:417-19 My '15

Physical laws of methane gas. P. F. Walker. Am Soc M E J 37:176-9 Mr '15

Metric system

Advantages of metric system. C: Vivier. Automobile 33:968-9 N 25 '15

If decimals of degree why not decimals of full circle? R. C. Hardman. Eng Rec 72:490 O 16 '15

Metropolis, Illinois

Bridges

Metropolis bridge over the Ohio river. diags Ry Age 59:160 Jl 23 '15

Concrete buildings in Mexico. Bldg Age 37: 29-30 F '15

Conditions in Mexico. Met & Chem Eng 13: 209-10 Ap '15

Situation in Mexico. Eng & Min J 100:445-6 S

See also Architecture—Mexico; Geology—Mexico; Latin America; Mines and mineral resources—Mexico; Petroleum—Mexico; Railroads-Mexico

Economic conditions

Business in Mexico. Eng & Min J 99:900 My 22 '15

New mining taxes in Mexico, Eng & Min J 100:691-2 O 23 '15

# Industries and resources

Occurrences of petroleum in eastern Mexico as contrasted with those in Texas and Lou-isiana. E. T. Dumble. Am Inst Min E Bul

104:1623-38 Ag '15; Discussion. 108:2434-5 D

See also Mines and mineral resources—Mexico; Petroleum—Mexico

Law

More Mexican mining law. Eng & Min J 100: 688 O 23 '15 mining edict in Mexico. Eng & Min J 99:668-9 Ap 10 '15 ew mining taxes in Mexico. Eng & Min J 100:811-12 N 13 '15

Miami copper company Miami copper company in 1914. J. P. Channing. Eng & Min J 99:55-6 Ja 9 '15

mica for stove openings. Metal Work 51 Jl 30 '15

Sheet mica for stove openings. Metal Work 84:151 Jl 30 '15
Temperature limits for mica insulation; discussion. Elec W 66:1130 N 20 '15
Temperature of mica insulation; discussion. Elec R & W Elec'n 67:942 N 20 '15
X-ray examination of built-up mica. C, N. Moore, il diag Gen Elec R 18:195-7 Mr '15; Same. Sci Am S 80:253 O 16 '15

Michigan

See also Roads-Michigan

Michigan Central railroad

Iichigan Central railroau
Economic value of the Detroit river tunnel.
Sci Am 113:422 N 13 '15
Important terminal improvement; Detroit
river tunnel, il Sci Am S 80:308 N 13 '15
Michigan Central and the Big Four. map Ry
Age 58:731-3 Ap 2 '15

Age 58:731-3 Ap 2 '15 69th annual report. Ry Age 58:771-2 Ap 2 '15

Michigan good roads association 7th annual convention, Grand Rapids, March 9-12. Good Roads n s 9:149-50 Ap 3 '15

Michigan railway New heavy electric railroad opened in Michigan, diags Eng N 74:212-13 Jl 29 '15

Michigan state association of master plumbers 23d annual convention, Detroit, April 6-7. Dom Eng 71:40-2 Ap 10 '15

Michigan state association of sheet metal contractors

mnual convention, Grand Rapids, Mich., March 10-11. Metal Work 83:445-6+ Mr 19 Annual

Michigan university

Automobile engineering curricula. W. T. Fish-leigh. Horseless Age 35:111-14 Ja 20 '15

Micrometers

Brown & Sharpe machinists' small tools, il Mach 21:759-60 My '15 History of the micrometer caliper again, L. D. Burlingame. Mach 22:58-9 S '15 How we came to have the micrometer caliper, L. D. Burlingame, il diags Mach 21:777-83 Je '15

How we came to have the micrometer caliper. W. D. Forbes. Mach 22:11 S '15

How we came to have the Slocomb shop mi-crometer. J. T. Slocomb. diag Mach 21:999-1000 Ag '15

Micrometer caliper as a machine shop gage. J. T. Slocomb. Mach 21:309-10 D '14

Reed & Frince micrometers, il Iron Age 96: 750 S 30 '15

Microphones

Aerial range-finding with electrical ears. il Sci Am 113:377 O 30 '15

Submarines betrayed by sound waves. il Sci Am 113:333+ O 16'15

Microphotography. See Photomicrography

Micropyrometer

Emissivity of metals and oxides; measure-ments with the micropyrometer, G. K. Bur-gess and R. G. Waltenberg, U. S. Bur Stand Bul 11:591-605 My 27 '15; Excerpt, Sci Am S 80:117 Ag 21 '15

Microscopes and microscopy
Ultramicroscope and its application to
ern biology. Sci Am S 80:211 O 2 '15 See also Metallography; Photomicrography

Middle age Why do men over forty break down? C: F. Bolduan, Sci Am 113:63 Jl 17 '15

Midvale steel & ordnance co.

Worth brothers and Remington arms; additional absorptions by the Midvale steel & ordnance co. Iron Age 96:908-9 O 14 '15

Migraine, See Headache

Mildew

Study of some curious painting phenomena. H: A. Gardner, il J Fr Inst 179:681-6 Je '15 Militarism

What is militarism? Sci Am 112:78 Ja 23 '15

See also Peace; United States-Defenses Military aeronautics. See Aeronautics, Military

Military aeronautics. See Aeronautics, Military
Military art and science
Art of deception in war. il Sci Am 112:124+
F 6 '15
As it was in the beginning. Sci Am 113:136
Ag 14 '15
Chlorine gas on the battlefield. Sci Am 112:
452 My 15 '15
Dispersion of the battlefield.

452 My 15 '15 Dispersing asphyxiating gases. il Sci Am 113: 93 Jl 31 '15 Improvised means of crossing rivers. il Sci Am 112:228 Mr 6 '15 Invisible man behind the gun. Sci Am 112:46 Ja 9 '15

Ja 9 15
Measurement of distances in war. A. Keller. il diags Sci Am S 79:324-5 My 22 15
Review of the year 1914; army and navy. Sci Am 112:6 Ja 2 15
Trench warfare; ten hours of trench digging for ten minutes of rifle fire. W. D. A. Anderson, il Sci Am 113:6-8 Jl 3 15

See also Aeronautics, Military; Artillery; Automobiles in war; Coast defense; Explosives, Military; Fortification: Grenades; Guns; Intrenchments: Mines, Military; Projectiles; Range finding; Shells; Shooting, Military; Shrapnel shells; Sieges; Target practice; Torpedoes; Transportation, Military; War; War games; also headings beginning Military ginning Military

Military automobiles. See Automobiles, Military

Military bridges

Building bridges under fire, M. Wells, il Sci Am 111:456-7 D 5 '14 Pontoon bridges and rafts. il Sci Am S 80:

116 Ag 21 '15

Military cars. See Cars, Military

Military communication. See Military telegraph; Military telephone

Military telephone
Military education
Business men's training camp at Plattsburg.
il Sci Am 113:182-3 Ag 28 '15
Military preparedness an insurance for peace.
L. Wood. Eng Rec 71:768-9 Je 19 '15
More military and naval academies. R. S.
Spear. Sci Am 113:9 JI 3 '15
West Point for non-commissioned officers.
F. C. Butler, Sci Am 112:403 My 1 '15
Military engineering

Military engineering
Electricity in present-day warfare. il Sci Am
113:494+ D 4 '15
Engineer function in modern warfare. Eng &
Min J 100:467-8 S 18 '15
Engineer in the field. J. Graham. Sci Am S
79:98 F 13 '15
Mobilizing the engineer companies of the militia. D A. Tomlinson. il Eng Rec 72:314-15
S 11 '15
Pioneers of the army T. Wolff Sci Am S 80:

S 11 '15
Pioneers of the army. T. Wolff. Sci Am S 80:
226-7 O 9 '15
Protecting a retreating army: effective methods of destroying its lines of communications, il Sci Am 112:406 My 1 '15
Specialized experience of engineers and contractors vital to country's defense. G: Perrine. il Eng Rec 72:594-6 N 13 '15
War geology. W. Salomon. Sci Am S 80:267 O 23 '15

War geology.

See also Fortification; Intrenchments: Mil-itary bridges; Military hygiene; Military lighting; Military reconnaissance; Military telephone; Mines, Military; Transportation; Military

Military explosives. See Explosives, Military

Military geography
Geographic aspects of the war. D. W. Johnson. diag Sci Am S 80:194-5, 222-4 S 25-O 2

Ups and downs of war. Sci Am 111:502 D 19 '14

Military hygiene
Pure water for the army; various forms of
field-service filters. il Sci Am S 80:89 Ag

7 '15
Purifying drinking water on the field. Sci Am S 80:288 O 30 '15
Sterilization of water-supplies for troops on active service G. S. Woodhead. Sci Am S 79:292-3 My 8 '15
Trench frost-bite. L. Smith. Sci Am S 80:357-8 D 4 '15

See also Surgery, Military; War—Relief of sick and wounded

Military lighting
Watching the enemy from the fighting line.
il Sci Am S 80:88-9 Ag 7 '15

Military photography. See Photography, Military Military postal service. See Postal service, Military

Military reconnaissance
Aerial scouting, H. Bannerman-Phillips, Eng
M 50:101-3 O '15
Mechanical aids for air scouts, il Sci Am 112:
175 F 20 '15 Military air scouting by motion pictures. E. A. Dench. Sci Am 112:156 F 13 15

Military shooting. See Shooting, Military

Military surgery. See Surgery, Military

Military telegraph
Telegraph and telephone in the German army.
il Sci Am S 80:177, 181 S 18 '15

Military telephone
Army field telephone and buzzer devised by signal corps. il Elec W 66:849-50 O 16'15
Field telephones for use in war; abstract.
C: R. Darling, diags Elec W 65:874-5 O 16'15
French field telephones. il Sci Am S 80:293 N

German military telephone system. H. March-and. il Sci Am 111:511 D 19 '14 Telegraph and telephone in the German army. il Sci Am S 80:177, 181 S 18 '15

Military tools Military ilitary tool with wide variety of uses. il Sci Am 113:471 N 27 '15

Military transportation. See Transportation, Military

Militia. See United States-Militia

Milk

Co-operation between railroads and shippers on milk supply. Ry R 56:158-9 Ja 30 '15 Electric sterilization of milk. Elec R & W Elec'n 67:994 N 27 '15 Electrified milk-distributing depot using cen-tral station service. il Elec W 66:650 S 18

Motors simplify operations in milk depot. J. L. Wiltse. il Elec W 66:363-5 Ag 14 '15

Purification of milk by electricity, il Elec W 64:1153-4 D 12 '14

Analysis

Device for the successive determination of the solids and fat in milk and other fluids. A. Seidenberg. J Ind & Eng Chem 7:769-73

Experimental data comparing the delicacy of different tests for hydrogen peroxide in milk. I. T. Darlington. J Ind & Eng Chem 7:676 I. T. Ag '15

Manufacture of condensed milk, casein, etc. R. T. Mohan. Sci Am S 80:26 Jl 10 '15

Bacteriology

Studies in bacterial metabolism. A. I. Kendall, A. A. Day and A. W. Walker. Am Chem Soc J 36:1937-66 S '14

Milk, Condensed
Manufacture of condensed milk, casein, etc.
R. T. Mohan. Sci Am S 80:14-15, 26 Jl 3-10

Miller, Spencer, 1859-Sketch. por Eng M 50:217 N '15

Milling costs. See Ore treatment-Cost

Milling cutters
Interlocking milling cutters. diags Mach 21: 911-12 Jl '15

Milling machinery. See Crushing machinery

Milling machines

Compound indexing on the milling machine. J: A. Hinckley. Mach 21:1005 Ag '15 Cutting short lead spirals. il Iron Age 94:1293 D 3 '14

D 3 14
Efficiency in milling and boring: Dodge miller turns out 18 cylinder blocks and heads in 1 hour. il Automobile 32:377 F 25 '15
Fast continuous milling. il Mach 21:998 Ag '15
Fixtures for continuous milling. A. B. Bachmann. il diags Mach 21:351-4 Ja '15
History of the milling machine. L. D. Burlingame. il Iron Tr R 56:923-6 My 6 '15
Kempsmith spindle nose construction. il diag Mach 21:1021 Ag '15
Machine for milling spiral grooves. G: Werner, jr. diag Mach 22:163-4 O '15
Milling attachments. L. J. Rodgers. il Mach 21:272 D '14
Oesterlein milling machines. il Mach 21:595

Oesterlein milling machines. il Mach 21:272 D '14

Oesterlein milling machines. il Mach 21:595

Mr '15; Iron Age 95:444 F 25 '15

Plano-type milling machine. il Engineer 120:

139 Ag 6 '15

Rapid finishing of automobile castings. il Iron Age 94:1282-3 D 3 '14 Spiral milling attachment. il diag Iron Age 95:

1389 Je 24 '15
Square-end milling fixture. O. A. Webster. il diags Mach 21:1009 Ag '15
Three adaptable milling fixtures. C. F. Meyer. il diags Mach 21:962-5 Ag '15
Turning a ball on the milling machine. G: Slider. diag Mach 21:407 Ja '15
Twin machines for Packard rear axles. il Automobile 32:684 Ap 15 '15
Uninterrupted feed milling machine. il Iron Age 96:1234 N 25 '15
Vertical milling machine for shrapnel, il Iron Age 95:1281 Je 10 '15

See also Die-sinking machines: Gear cut-

See also Die-sinking machines; Gear cut-ting; Machine tools

Mills and millwork
Estimating the cost of mill buildings. C: F.
Dingman. Eng & Contr 44:185 S 8 '15
Wind stresses in steel mill-buildings. R. Fleming. diags Eng N 73:210-14 F 4 '15

See also Cotton mills; Factories; Flour mills; Knitting mills; Machinery; Manufactures; Paper mills; Rolling mills; Sawmills; Scientific management; Textile mills

# Milwaukee, Wisconsin

# Bridges

Actual operations in connection with the shift-ing of double-track swing spans on the Chi-cago & Northwestern Ry, il Eng & Contr 43:359-60 Ap 21 '15 Design and construction work preliminary to the actual shifting of a double-track

43:393-00 AP 21 15 esign and construction work preliminary to the actual shifting of a double-track swing bridge on the Chicago & Northwestern Ry. plans Eng & Contr 43:356-9 Ap 21 '15

# Railroads

Operating the Milwaukee (Wis.) terminals of the St. Paul. W. B. Hinrichs. Ry Age 57: 1050-1 D 4 '14

# Rapid transit

Milwaukee fare case decided. Elec Ry J 46: 52-3 Jl 10 '15
Zone system of fares in practice; with discussion. R. B. Stearns. Elec Ry J 45:836-8 My 1 '15

# Sanitary affairs

Milwaukee bureau of street sanitation. Munic J 37:888-90 D 17 '14

#### Sewerage

Sewerage
Activated-sludge experiments. T. C. Hatton. diags Eng N 74:134-7 Jl 15 '15
Milwaukee sewerage problem and the sewage treatment testing station. T. C. Hatton. Eng & Contr 42:367-9 O 14 '14
World's first full-scale plant for the treatment of sewage by the activated sludge process. T. C. Hatton. diags plan Eng & Contr 41:322-7 O 27 '15; Same cond. Eng Rec 72: 481-4 O 16 '15; Abstract. Munic J 39:776-7 N 18 '15

## Water supply

Construction plant and methods employed on new water works intake tunnel, il diags plan Eng & Contr 43:352-5, 371-2 Ap 21-28 '15

Curtailment of water waste and selection of meters at Milwaukee water works. Eng & Contr 42:176 Ag 19 '14

Meter maintenance systematized by waterworks department in Milwaukee, il Eng Rec 71:587-8 My 8 '15

Special features in the new intake tunnel at Milwaukee. L. G. Warren, diags Eng N 73: 686-7 Ap 8 '15

Mine accidents

Accident prevention by the New Jersey zinc
co. B. F. Tillson. Eng & Min J 98:1034-9 D co. B. 12 '14

12 '14
Accident rate at various hours of the day;
table. Eng & Min J 100:239 Ag 7 '15
Accidents from falls of rock or ore. E. Higgins. il U S Bur Mines Circ 17:1-13 '14;
Same. Iron Tr R 56:375-7+ F 18 '15
Causes of electrical accidents in English collieries. diag Elec R & W Elec'n 67:903 N 13

Compensation laws and accidents. E. N. Zern. Colliery 35:433-5 Mr '15
Metal-mine accidents in the United States, during the calendar year 1913. A. H. Fay. U S Bur Mines Tech Pa 94:1-70 '14
Mile beyond the sunshine. Sci Am 113:450 N 20

Statistical data on fatal and nonfatal accidents. C. B. Dutton. tables U S Bur Mines Bul 75:174-245 '15

Unusual and historic accidents. W. R. Ingalls and L. O. Kellogg, U. S. Bur Mines Bul 75: and L. O 257-76 '15

See also Coal mines and mining—Accidents and explosions; Firedamp; Mine explosions; Mine fires; Mine rescue work; Mining engineering—Safety devices and measures; Safety lamps

Mine accounting
Recording and comparing mining data. I
Rubidge. Eng & Min J 99:193-4 Ja 23 '15 Mine air

Humidifying mine air. J. W. Reed. Colliery 35:330-2 Ja '15 Humidity of mine air. Colliery 35:302 Ja '15

Humidity of mine air. R. Y. Williams. il map U S Bur Mines Bul 83:1-63 '14

Hygrograph, H: Briggs. Colliery 35:374-5 F '15 Rock-dust sampler. O. Ruhl. il Eng & Min J 99:238 Ja 30 '15

See also Mine gases; Mine ventilation

Mine animals. See Live stock; Mules

Mine buildings

Aurora's change house. W: S. Black. plan Eng & Min J 100:310-11 Ag 21 '15 il diag

Saw-tooth colliery building, il diags Colliery 35:235 D '14

Shaft-rockhouse practice in the copper country. L. H. Goodwin, il diags Eng & Min J 99:1061-6, 1107-10; 100:7-12, 53-7 Je 19-Jl 10

See also Miners' houses

# Mine bulkheads

Design, construction, and cost of two mine bulkheads at Hibernia mine, New Jersey. S. L. Wise and W. Strache. diags Colliery 35:256-9 D '14; Same. Eng & Contr 42:309 S

Mine cages. See Mine hoisting

Mine cars

Application of roller bearings to mine-car haulage. P. N. Case, diags Eng & Min J 100:144-6 Jl 24 '15

Automatic end gate for mine cars. A. G. Morlock, diags Eng & Contr 43:185 F 24 '15

Mine chutes. See Mine timbering

Mine construction Arching in collieries. R. G. Clark, diags Colliery 35:292-6 Ja '15

Concrete in mine work. S. Reynolds, Colliery 35:407-8 Mr '15

Concrete underground ore pocket at Co Queen. F. M. Heidelberg, diags Eng & J 100:559-61 O 2 '15

Design of angle-sheave frames. F. L. Burr. Eng & Min J 99:359-64, 403-8 F 20-27 '15

Mine construction-Continued

Reinforced concrete props and beams in mines. S. M. Dixon. Colliery 35:431-2 Mr '15

See also Headframes; Mine bulkheads; Mine dams; Mine shafts; Mine timbering; Mine tipples

Mine dams

Effectual sealing of water dams. F. H. Water-house, diags Colliery 36:35-6 Ag '15

Roosevelt drainage tunnel, Cripple Creek, Colorado. T. H. Sheldon. il map Eng & Min J 100:545-9 O 2 '15

See also Mine pumping

Mine equipment

Design and construction of a concrete idler stand. H. H. Hunter. diags Eng & Contr 44:413-14 N 24 '15

Electrical equipment rules. Colliery 35:678+

J1 '15

Vivian. diags Eng & Min J 98:1095 D 19 '14

See also Electricity in mining; Mine cars;
Mine haulage; Mine hoisting; Mining machinery chinery

Mine explosions

Air blasts at Quincy mine, Houghton, Mich.

Eng & Min J 99:914-15 My 22 '15

Carlisle mine explosion. W: Z. Price. Colliery 35:464 Ap '15

Coroner's report on Mulga disaster. Colliery

Coroner's report on Mulga disaster. Colliery 35:236 D '14
Explosibility of acetylene. G: A. Burrell and G. G. Oberfell. U S Bur Mines Tech Pa 112: 1-12 '15

What a miner can do to prevent explosions of gas and of coal dust. G: S. Rice. U S Bur Mines Circ 21:1-21 '15

See also Coal dust; Coal mines and mining

—Accidents and explosions; Mine accidents; Mine air; Mine fires; Mine gases

Mine fans. See Mine ventilation

Mine fires

Anticipating mine fires, J. McCrystle, plan Colliery 36:79-80 S '15 Black Hawk mine fire; use of oxygen helmet apparatus, J. B. Forrester, map Colliery 36: 12-18 Ag '15 Causes of mine 6

Causes of mine fires. A. C. Starr. Colliery 35: 532 My '15

532 My '15 Fire-fighting methods at the Mountain View mine, Butte, Mont. C. L. Berrien. 11 pls Am Inst Min E Bul 102:1215-45 Je '15 Reversing main air-currents. W: Clifford. diags Colliery 35:544-5 My '15 Stripping at the National colliery, il Colliery 35:598-9 Je '15

See also Firedamp; Mine explosions; Safety lamps

Mine foremen

Answers to examination questions for mine foreman and fire boss in various states in 1914. Colliery 35:447-50 Mr '15

Answers to examination questions for mine foreman and fire boss in various states in 1915. Colliery 36:163-5 O '15

Mine foreman and first aid. W. McIntyre, jr. Colliery 35:296 Ja '15

Questions selected from those asked at an examination for mine foreman, held in Price, Utah, September 15 and 16, 1914. Colliery 35:217-20, 276-9, 338-41 N '14-Ja '15

Questions selected from those asked at examinations for mine foreman and fire boss in various states in 1915. Colliery 36:50+, 195-7 Ag-S '15

as caps and gas discharges. J: Thompson. Colliery 35:608-9 Je '15

Gas-detecting apparatus. W. G. McMillan, Colliery 35:611 Je '15

Occurrence of explosive gases in coal mines. N. H. Darton, bibliog diags maps U S Bur Mines Bul 72:1-237 '15

Origin, occurrence, and behavior, of the gases usually found in mines. F. Haas. Colliery 35:375-9 F '15; Discussion. 35:436-41, 483-5, 501-2 Mr-Ap '15

See also Firedamp; Mine air; Mine explosions; Mine ventilation

Mine haulage

Electric haulage problem. Colliery 35:560 My

'15
Handling stock-pile cars. F. H. Armstrong. il
Eng & Min J 100:355 Ag 28 '15
Mine mule investigations. G. E. Wentworth.
Colliery 35:261-2 D '14
Moving ore in flat stopes. E. M. Weston. il
diag Eng & Min J 100:665-6 O 23 '15
Proposed incline haul. M. M. Haley. plan
Colliery 36:127 O '15
Rate of hand tramming. Eng & Min J 100:226
Ag 7 '15

Regenerating electric ore railroad. Eng M 49: 121-2 Ap '15 121-2 Ap '15 Tramming and hoisting at Copper Queen mine. G. F. G. Sherman, il diags Am Inst Min E Bul 105:1837-85 S '15

See also Locomotives, Mine; Mine cars; Mine hoisting; Mine tipples; Mine tracks

#### Cost

Gasoline locomotive haulage; its cost as compared to mule haulage at mines of Trosper coal co., Bradel, Ky. il Colliery 35:547-8 My

Mine hoisting

Alaskan ore-hoisting rig. W. Swaren. diag Eng & Min J 100:392 S 4 '15 Automatic landing chairs, il Eng & Min J 100: 761 N 6 '15

Balancing dummy in inclined shaft, L. H. Goodwin, Eng & Min J 98:1001-2 D 5 '14 Bucket-dumping device, H. A. Linke, diag Eng & Min J 99:944 My 29 '15

Design of angle-sheave frames. F. L. Burr. Eng & Min J 99:359-64, 403-8 F 20-27 '15 Diameter of sheaves for hoisting rope. Eng & Min J 100:883 N 27 '15 Electric winding; abstract. Elec W 66:876 O

Electric Winding; abstract. Elec W 65:876 U 16 '15
Facing-off a brake wheel. A. E. Hall. il Eng & Min J 100:760 N 6 '15
Features of the electrical equipment for the Granite mountain hoist. G. B. Rosenblatt. il diag Assn Eng Soc J 54:199-209 My '15
Fleeting device for hoist with conical drums. F. H. Armstrong. il diag Eng & Min J 99: 945 My 29 '15
French electric mine hoist. il Colliery 35:468-70+ Ap '15
Granite mountain hoist. G. B. Rosenblatt. Eng & Min J 100:115-16 Jl 17 '15
Hoist and compressor power curves. P. E. Barbour. Eng & Min J 99:988-9 Je 5 '15
Large electric hoist. W. Sykes. il diags Am Inst E E Pro 34:1819-27 Ag '15
Large electric hoist for Montana mine. Elec R & W Elec'n 67:943-4 N 20 '15
Lateral friction of winding ropes; abstract. H. W. G. Halbaum. Am Soc M E J 37:351-2 Je '15
Men and machinery of the Comstock—pioneer

Men and machinery of the Comstock—pioneer hoisting works. G. W. Dickie. il Eng & Min J 98:1130-4 D 26 '14
Prevention of overwinding and overspeeding in shafts. G. G. T. Poole. Colliery 36:20-2 Ag '15

Reversing rope on single-drum hoist. C. M. Rasmussen. Eng & Min J 99:655-6 Ap 10 '15 Silver Hill underground hoisting station. J. Humes. il diags Eng & Min J 100:747-51 N

Sliding board for hoisting ropes. D. E. Charlton. diags Eng & Min J 100:393 S 4 '15

Spillage and sinking pocket. A. E. Hall. diags Eng & Min J 99:612 Ap 3 '15

Steel headframe at no. 9 shaft, Republic mine, Vulcan, Mich. F. L. Burr. il diags Eng & Min J 100:379-82, 430-5 S 4-11 '15

Substitute for rollers in incline. H. H. Hodg-kinson. diag Eng & Min J 99:149-50 Ja 16 '15

Tests of large steam hoists. H. E. Spring. Gen Elec R 18:179-89 Mr '15

Tramming and hoisting at Copper Queen mine. G. F. G. Sherman. il diags Am Inst Min E G. F. G. Sherman. il Bul 105:1837-85 S '15

Underground crushing and loading arrange-ments. A. E. Hall. diags Eng & Min J 99:192-3 Ja 23 '15

Wooden or steel cages. Colliery 35:446 Mr '15 See also Mine haulage

Mine inspection

Digest of state metal-mine inspection laws. C. B. Dutton, U S Bur Mines Bul 75:129-63 15

Inspection of mines, J. L. Mullen, Colliery 35: 435 Mr '15

Inspection systems maintained by mining companies. L. O. Kellogg. U S Bur Mines Bul 75:246-53 '15 Organization of existing state mine-inspection systems. L. O. Kellogg. U S Bur Mines Bul 75:164-73 '15 Safety inspection.

Safety inspection system of the Susquehanna coal co. F. C. Curtis. Colliery 35:607-8 Je '15

Mine inspectors

State geological and mining officials. Eng & Min J 99:104 Ja 9 '15

Mine labor. See Coal miners; Miners

Mine ladders. See Ladders

Mine lighting

Illumination of mines. R. P. Burrows, il plan Am Inst Min E Bul 107:2237-45 N '15

Mine locomotives. See Locomotives, Mine

Mine management

Coal mining in West Virginia. J. E. Coleman. il Sibley J 30:21-7 O '15 E. E. White coal company mines. G: D. Evans. il Colliery 35:401-7 Mr '15 Efficiency in coal mining. G: S. Brackett. Colliery 25:588-92 Je '15 Essentials of organization and management. J. R. Finlay. il Eng & Min J 100:171-6 Jl 31 '15

31 '15
Handling drill steel at the Quincy mine. L. H.
Goodwin. plan Eng & Min J 99:16 Ja 2 '15
Investments in Iron river district. C. A. Tupper. il Iron Tr R 56:759-64 Ap 15 '15
Labor factor in bituminous mines. G: S.
Brackett. Colliery 36:99-100 S '15
Operations in the New River field. W: Z.
Price. il Colliery 35:536-7 My '15
Practical economy at coal mines. L. G. Hauger.
Colliery 36:128-31 O '15

See also Mine foremen

Mine models

Mine models
Mine model of the Broken Hill lode, il Eng &
Min J 99:1076-7 Je 19 '15
Mine model of vertical glass plates, diags Eng
& Min J 99:236-7 Ja 30 '15
Mine models made of celluloid sheets, M. C.
Lake, diag Eng & Min J 99:737 Ap 24 '15
Mt. Hope mine model, J. C. Stockland, il Eng
& Min J 99:446 Mr 6 '15

Mine motors. See Mining machinery

Mine power. See Mining engineering-Power

Mine power, See Mining engineering—Power
Mine pumping
Centrifugal mine pumps on the Rand; with
cost data. E. G. Izod and A. P. Rouillard.
diags Eng & Min J 99:1115-16 Je 26 '15
Dewatering an anthracite mine. W: Z. Price.
il diags Colliery 36:87-90 S '15
Economical pump arrangement. H. S. Lee. diag
Eng & Min J 99:281 F 6 '15
Mine pumping; comparison of steam and electric pumps. C: Legrand. Am Inst Min E Bul
105:1929-35 S '15

Mine railroads. See Mine ties; Mine tracks; Railroads, Industrial

Mine records. See Mine accounting

Mine records. See Mine accounting
Mine rescue work
Berwind-White first-aid meeting. il Colliery
35:254-5 D '14
Black Hawk mine fire; use of oxygen helmet
apparatus. J. B. Forrester, map Colliery 36:
12-18 Ag '15
First-aid contest, Superior coal company, il
Colliery 35:429-30 Mr '15
First-aid instructions for miners. M. W. Glasgow, W. A. Raudenbush, and C. O. Roberts.
il U S Bur Mines Circ 8:1-64 '15
Layland rescue work. E. A. Henry. Eng & Min
J 99:666-7 Ap 10 '15
Montana first aid. Colliery 36:85-6 S '15
Royalton mine explosion. il plan Colliery 35:
263-8 D '14

Self-contained rescue apparatus. J. S. Haldane. Colliery 36:81-3 S '15

Telephones for use in mine rescue work de-monstrated at San Francisco. il Elec R & W Elec'n 66:830 My 1 '15

Mine roofs
Stresses in the mine roof, R. D. Hall, diags
Am Inst Min E Bul 105:2013-21 S '15

Mine sanitation

Pulmonary disease among miners in the Joplin district, Missouri and its relation to rock dust in the mines. A. J. Lanza and E. Higgins, il maps U S Bur Mines Tech Pa 105:1-47'15; Abstract. Eng & Min J 99:331-3 F 13

See also Mine ventilation

Mine shafts

Cover for shaft ladderway, D. E. Charlton, diag Eng & Min J 100:269 Ag 14 '15 Fireproofing mine shafts, diags Colliery 35:441-

Fireproofing mine shafts. Eng & Min J 99: 421 F 27 '15
Gunite casing on wood shaft lining. S. Royce. il diags Eng & Min J 99:409-11 F 27 '15
Inclined shaft for timber on the Mesabi. L. D. Davenport, diags Eng & Min J 99:776-7 My

Interlining a timber and steel lined shaft with a cement gun. S. Royer. diag Eng & Contr 44:278 O 6 '15

44:278 O 6 <sup>7</sup>15 Reinforced-concrete shaft sets, L. D. Davenport, il plans Eng & Min J 99:447-8 Mr 6 <sup>7</sup>15 Simple folding shaft gate, F: T. Teddy, diag Eng & Min J 100:599-600 O 9 <sup>7</sup>15 Steel shaft timbering at Los Ocotes mine, R. H. Cromwell, diags Sch Mines Q 36:143-6 Ja <sup>7</sup>15; Abstract, Eng & Min J 100:802 N 13

Use of concrete underground; methods in use in some shafts in the copper country. H. T. Mercer. diags Colliery 35:419-26 Mr '15 Vertical-shaft steel stairway. plan Eng & Min J 98:1002 D 5 '14

See also Headframes; I Shaft lining: Shaft sinking Mine timbering:

Mine shops Colliery repair shops. W: Z. Price. il Colliery 35:269-71 D '14

Mine signals

Automatic signal system used in stock-piling iron ore. J: F. Murphy. diags Eng & Min J 100:225 Ag 7 '15

Battery bell signaling in English mines. R. V. Wheeler. Elec R & W Elec'n 66:903-4 My 15 '15; Same. Elec W 65:1304 My 22 '15

Locked signal system in the Palmer shaft of the New Jersev zinc co.'s mine at Franklin, N. J. H. H. Hodgkinson. diags Eng & Min J 99:777-8 My 1 '15

Rosehall signal indicator. J. Black. diags Colliery 35:479-80 Ap '15

Warning bell for topman. H. A. Linke. diag Eng & Min J 99:655 Ap 10 '15

Winding-engine signals. W. H. Davis. il diag Colliery 36:83-5 S '15

Mine surveying

line surveying
Azimuth estimation from incorrect plumbing,
A. E. Flynn. Eng & Min J 99:695 Ap 17 '15
Compass surveying. R: Bowen. Colliery 35:
417-18 Mr '15
Engineering notes and methods at Miami,
H. P. Bowen. Eng & Min J 100:15-17 JJ 3 '15
Surveying in anthracite mines. W: Z. Price,
diag Colliery 35:461-4, 541-3 Ap-My '15
Top telescope problem. F. W. Sperr. diags
Colliery 35:523-6 My '15

Triangulating from two plumb wires. A. G. Wolf. Eng & Min J 98:1043-4 D 12 '14

What the dip needle can and cannot do. C. A. Cheney, jr. Eng & Min J 100:193-4 Jl 31 '15 What the dip needle can and cannot do. W. O. Hotchkiss. Eng & Min J 100:363 Ag 28 '15

Mine taxation
Abstracts of current decisions on mines and mining, October, 1914, to April, 1915. J. W. Thompson. U S Bur Mines Bul 101:121-5 '15

Harrison bill, recently defeated in the Minnesota legislature. Eng & Min J 100:877-8 N 27

ine taxation in Mexico. E. A. H. Tays. Eng & Min J 99:913 My 22 '15 Mine

New mining taxes in Mexico. Eng & Min J 100:811-12 N 13 '15

See also Mine valuation

Mine temperature

Normal underground temperatures. Eng & Min J 100:475 S 18 '15

Mine ties Slick steel mine tie. diag Colliery 35:342-4 Ja Slick steel mine ties, il diags Ry R 56:436-7 Mr 27 '15

Steel mine ties. il Colliery 35:380-1 F '15

Mine timber

Preservation of mine timber, H. A. Appel.
Colliery 35:481-3 Ap '15
Rocky mountain mine timbers, N. de W.
Betts, diag U S Agric Bul 77:1-34 '14
United States mining statutes annotated; timber cutting for mining purposes, J. W.
Thomson J. C. Phy Mines Bul 14 in 2, 1324ber cutting for mining purposes. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 1334-

Mine timbering

Coal mining problem: hydraulic stowage. Engineer 118:526 D 4 '14 Comparative timbering costs in mine and sub-way, diag Eng & Min J 100:689-90 O 23 '15 Composite mine props. diags Colliery 35:383 F

Improved chute hook. diags Eng & Min J 100:

227 Ag 7 15 Light shaft timbering, H. A. Linke, diags Eng & Min J 99:696 Ap 17 15 Method of reinforcing set timbers, H. H. Hodgkinson, diag Eng & Min J 98:1001 D 5

Rock- and ore-chute door. D. E. Charlton, diag Eng & Min J 100:226-7 Ag 7 '15
Safety in systematic timbering. W. P. Kearns, il plan Colliery 35:254 D '14
Shaft timbering and headgear on the Mesabi range, diags Eng & Min J 99:1119 Je 26 '15
Steel shaft timbering at Los Ocotes mine. R. H. Cromwell, diags Sch Mines Q 36:143-6
Ja '15; Abstract, Eng & Min J 100:802 N 13

Substantial ore chute. H. H. Hodgkinson. plan Eng & Min J 99:861-2 My 15 '15 '15 Timbering stopes for safety. H. H. Hodgkinson. diags Eng & Min J 99:818-20; 100:69 My 8, JI 10 15

8, JI 10 15
Types of chutes and chute gates. A. E. Hall.
diags Eng & Min J 99:738-9 Ap 24 '15
Unique method of sinking shafts in soft
ground. L. T. Emory. il Eng N 73:397-8 F
25 '15; Same cond. Eng & Min J 99:945-6

See also Headframes; Mine construction; Mine shafts

Mine tipples

Lucerne power plant and tipple of the Rochester & Pittsburg coal and iron co. C. M Young. il Colliery 36:1-6 Ag '15

Mine tracks

Calculating diamond crossover for shaft bottom, diag Eng & Min J 100:762 N 6 '15' Importance of good mine tracks, J. C. Edwards, Colliery 35:471-2 Ap '15

See also Mine ties

Mine valuation

observations on the appraisal of the iron mines of Michigan, C. H. Baxter, Eng & Min J 99: 439-40 Mr 6 '15

Principle of coal evaluation, R. W. Coulthard, Colliery 36:22 Ag '15

Valuation of Arizona's producing mines. Eng & Min J 100:469 S 18 '15

Valuation of coal lands, W. E. Fohl, Colliery 36:64-6 S '15

Mine ventilation
Influence moisture in the air has on mine ventilation; abstract. A. C. Whittome. Am Soc M E J 37:563-4 S '15

Pressure ventilating system used in Cripple Creek mines, S. A. Worcester, diags Eng & Min J 99:981-5 Je 5 '15

Reversing main air-currents. diags Colliery 35:544-5 My '15 W: Clifford.

Running a fan economically. Colliery 35:398 F

Testing of ventilating fans. T: Bryson, Colliery 35:465-7 Ap '15; Abstract. Am Soc M E J 37:124 F '15

Ventilating a dead heading. P. Ruth, jr. plan Eng & Min J 100:226 Ag 7 '15

Ventilation of the Copper Queen mine. C: A. Mitke. diags Am Inst Min E Bul 105:1941-58 S '15; Discussion. 108:2477-8 D '15

See also Mine air

Mine water

Comparison of the water of Sulphur Springs with deep well and mine waters. C. E. Siebenthal. Econ Geol 9:762-3 D '14
Composition of waters in mines of sulphide ores. E. T. Hodge. Econ Geol 10:123-39 F '15

See also Mine dams; Mine drainage

Mineral industries

lineral industries
American smelting and refining co.; abstract of the annual report for 1914. Eng & Min J 99:582-3 Mr 27 '15
British mineral statistics. Engineer 119:249-50 Mr 12 '15
Doing without Europe. Sci Am 112:128, 157+F 6-13 '15
Foreign mineral trade of Great Britain. Eng & Min J 99:442 Mr 6 '15
Mineral-ındustry exhibit at the National museum. C. G. Gilbert. il Eng & Min J 100:470-2 S 18 '15
See also Metal trade: Matallysque Mines

See also Metal trade; Metallurgy; Mines and mineral resources; Mining industry and finance; also names of particular indus-tries, e. g. Iron industry and trade

Mineral lands

Abstracts of current decisions on mines and mining, December, 1913, to September, 1914.

J. W. Thomson, I'S Bur Mines I'ul 90: 1-11, 24-48, 131-53 '15
Abstracts of current decisions on mines and mining, October, 1914, to April, 1915.

J. W. Thompson, U'S Bur Mines Bul 101:1-138 '15
Acquiring placer-mining claims in British Columbia.

J. A. Macdonald, diag Eng & Min J 100:575-9 N 6 '15
Conflicts between placer patents and lode claims, A. L. H. Street. Eng & Min J 99: 736 Ap 24 '15
Forest service and the prospector.

A. L. H. Street. Eng & Min J 100:570 O 2 '15

'15
Forfeiture of placer locations, A. L. H. Street.
Eng & Min J 100:224 Ag 7 '15
Nature of title to mine claims. A. L. H.
Street, Eng & Min J 100:666-7 O 23 '15
Prospecting for minerals in Ontario. J. A.
Macdonald. Eng & Min J 99:1667-8 Je 19 '15
Relocation of mining claims. A. L. H. Street.
Eng & Min J 100:227 Ag 7 '15
Right of a mining or ore-milling company to condemn land. A. L. H. Street. Eng & Min J 100:757 N 6 15

J 100:757 N 6 15 Sliding royalties for oil and gas wells, R. H. Johnson, Am Inst Min E Bul 102:1292-4 Je '15; Discussion, 108:2423-5 D '15

Staking out mineral claims in Ontario. J. A. MacDonald. diag Eng & Min J 99:324-5 F 13

United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:1-1772 '15

See also Coal lands; Mines and mineral resources; Ore deposits

Mineral oils. See Petroleum

Mineral resources. See Mines and mineral resour-

Mineral springs. See Mineral waters

Mineral waters

Spring deposits at Sulphur Springs, Ark. C. E. Siebenthal. Econ Geol 9:758-67 D '14

Mineralogy

rigin and occurrence of certain crystallo-graphic intergrowths. J. Segall, 2 pls Econ Geol 10:462-70 Jl '15

Tables for the determination of gems and precious or ornamental stones without injury to the specimen. A. J. Moses. Sch. Mines Q 36:199-232 Ap '15

See also Abrasives; Assaying; Crystallog-raphy; Earths, Rare; Geology; Metals; Mines and mineral resources; Rocks; Stone; also names of minerals, e. g. Coal Minerals. See Mineral lands; Mineralogy; Mines and mineral resources

Miners

Ilners
Ancient gold mining in East Africa; extracts from Diodorus the Sicilian. A. B. Coli. Eng & Min J 99:1041-2 Je 12 '15
Arizona copper miners' strike. il Eng & Min J 100:605-7 O 9 '15
Change in character of mining communities. Colliery 35:587 Je '15
Government ownership and the miner. E. L. Bailey. Colliery 35:490-1 Ap '15
Miners' wages again. Engineer 120:228-9 S 3 '15

'15
Nystagmus (trembling of the eyes) of the miners. Colliery 35:505 Ap '15
Phthisis conditions on the Rand. A. C. Key. Eng & Min J 99:28-9 Ja 2 '15
Pulmonary disease among miners in the Jop-lin district, Missouri and its relation to rock dust in the mines. A. J. Lanza and E. Higgins, il maps U S Eur Mines Tech Pa 105:1-47 '15; Abstract. Eng & Min J 99: 331-3 F 13 '15
Strike situation in Arizona. il Eng & Min J

trike situation in Arizona. il Eng & Min J 100:731-3 O 30 '15 Strike

See also Coal miners; Mine rescue work; Mining towns

Miners' houses Steel and concrete mine houses. diags plan Eng & Min J 99:987-8 Je 5 '15

Mines. Bureau of. See United States-Mines. Bureau of

Mines, Military
Mining and countermining of fortifications. il
Sci Am 111:464-5 D 5 '14

See also Mines, Submarine

Mines, Submarine
Mines in the North sea. il Sci Am 111:489 D
12 '14

12 '14
Observation mines for harbor protection. il
Sci Am 113:430 N 13 '15
Sinker of the Bouvet, Irresistible and Ocean?
il Sci Am 112:402 My 1 '15
Submarine mines; their design and their manner of functioning. J. Huber. diags Eng M
50:120-1 O '15
Swimming mine. diag Eng M 50:122 O '15

Mines and mineral resources

Data of the world's principal mines. S. F. Shaw. Eng & Min J 99:84-5 Ja 9 '15 World's mineral reserves. E. C. Eckel. Eng M 48:658-66 F '15

48:658-66 F '15

See also Coal mines and mining; Copper mines and mining; Geology; Gold mines and mining; Hydraulic mining; Iron mines and mining; Lead mines and mining; Lead mines and mining; Lead mines and mining; Lead mines and mining; Magnesite; Meerschaum; Mercury; Metals; Mine fires; Mine management; Mine surveying; Mine ventilation; Mineral lands; Mineralogy; Miners; Mining engineering; Mining laws; Mining machinery; Molybdenite; Monazite; Ore deposits; Petroleum; Phosphates; Prospecting; Quarries and quarrying; Salt; Shaft sinking; Silver mines and mining; Sulphur; Tin mines and mining; Zinc mines and mining mining

# Exhibitions

Panama-Pacific exposition. il plan Colliery 35: 657-63 Jl '15

### Alaska

Alaskan mining in 1914. Eng & Min J 99:116-19 Ja 9 '15

19 Ja 9 '15 Kenai district, Alaska. Eng & Min J 100:676 O 23 '15

O 23 '15 Stoping methods at Fairbanks. H. I. Ellis. il Eng & Min J 100:503-6 S 25 '15

See also Coal + 110 + 13 mining—Alaska Gold mines and mining—Alaska; Petroleum-Alaska

#### Arizona

Arizona in 1914. map Eng & Min J 99:105-7 Ja 9 15

See also Copper mines and mining

#### Australia

Cloncurry copper district, Queensland. W. H. Corbould. diags Am Inst Min E Bul 97:83-92 Ja '15

State assistance to the mining industry in Australia. Eng & Min J 100:445 S 11 '15

Bolivia

Mining in Bolivia. H. L. Venables. Eng & Min J 99:662 Ap 10 '15

J 99:662 Ap 10 '15
Ownership of Bolivian mines. M. G. F. Söhnlein. Eng & Min J 99:459 Mr 6 '15

See also Gold mines and mining-Bolivia; Tin mines and mining

# British Columbia

Mining in British Columbia in 1914. Eng & Min J 99:121 Ja 9 '15 See also Coal mines and mining-British

Columbia Burma

Bawdwin mines of the Burma corporation, il map plan Eng & Min J 99:177-80 Ja 23 '15 Wolframite in lower Burma, E. M. Lefroy, Eng & Min J 99:684 Ap 17 '15

#### California

Mining in California in 1914. L: H. Eddy. Eng & Min J 99:107 Ja 9'15 Pocket deposits of the Klamath mountains, California. H: G. Ferguson. il maps Econ Geol 10:241-61 Ap'15 Seneca mining district, California. W. H. Wright. il map Eng & Min J 99:1072-4 Je 19

15

See also Petroleum-California

Mineral production of Canada, J: McLeish, Eng & Min J 99:488-9 Mr 13 '15 See also Coal mines and mining-Canada

#### Central America

Central America in 1914. Eng & Min J 99:124-5 Ja 9 '15

### Chile

Smelting at Panulcillo, Chile. il Eng & Min J 100:787-9 N 13 '15

See also Copper mines and mining; Gold mines and mining—Chile; Iron mines and mining—Chile; Petroleum—Chile; Potash

Mining conditions in China. F. L. Garrison. Eng & Min J 100:26-8 Jl 3 '15 See also Iron mines and mining-China

## Colorado

Metal mining in Colorado in 1914. G: E. Collins. Eng & Min J 99:108-9 Ja 9 '15 Mining in Boulder county, Colo. Eng & Min J 190:797-8 N 13 '15 Ores of Gilpin county, Colorado. E. S. Bastin. il Econ Geol 10:262-91 Ap '15

Sec also Gold mines and mining-Colorado

# Dominican republic

Minerals of Santo Domingo. F. L. Garrison. Eng & Min J 99:641-4 Ap 10 '15

# Great Britain

Mineral production of Great Britain, Eng & Min J 100:6 Jl 3 '15

## Idaho

Idaho mining industry in 1914. R. N. Bell. Eng & Min J 99:109 Ja 9 '15 Metallurgy in the Coeur d'Alenes. H. A. Megraw. il Eng & Min J 100:827-30 N 20 '15 New developments in the Coeur d'Alene, Idaho. H. l. Ellis. il Eng & Min J 100:337-40 Ag 28 '15

#### India

British India. U S Sp Cons Rep 72:413-23 '15

# Italy

Mineral output of Italy in 1913. Eng & Min J 99:690 Ap 17'15 Kentucky

and mining -Kentucky; Sec Coal mines a Petroleum—Kentucky

# Kongo, Belgian

Economic geology of the Belgian Congo, Central Africa, S. H. Ball and M. K. Shaler, it map Econ Geol 9:605-63 O '14; Excerpts. Eng & Min J 99:608-11 Ap 3 '15
Katanga increasing its output. R. Williams. Eng & Min J 100:308 Ag 21 '15

#### Mines and mineral resources -- Continued

#### Mexico

Lost mines, G. L. Sheldon, Eng & Min J 99: 746-8 Ap 24 '15

Main mineral zone of the Santa Eulalia district, Chihuahua. B. Prescott, diag map Am Inst Min E Bul 98:155-98 F '15

Mining in Baja California. Eng & Min J 99: 188-9 Ja 23 '15

Mining in Mexico in 1914. Eng & Min J 99:122-4 Ja 9 '15

Sec also Petroleum-Mexico

Sec Iron mines and mining Minnesota

#### Montana

Mineral county, Montana, mining notes. H. I. Ellis. Eng & Min J 100:895-6 N 27 '15

Mining in Montana in 1914. T. Simons. Eng & Min J 99:110 Ja 9 '15

Occurrence of covellite at Butte, Mont. A. P. Thompson, il Am Inst Min E Bul 100:645-77 Ap '15; Discussion, 108:2464-71 D '15

See also Coal mines and mining—Montana; Geology—Montana; Petroleum—Montana

#### Nevada

Mining in Nevada in 1914. Eng & Min J 99: 111-12 Ja 9 '15

See also Gold mines and mining Nevada

#### New Mexico

New Mexico in 1914. Eng & Min J 99:112-13 Ja 9 '15

Pinos Altos district, New Mexico. I. L. Wright. il Eng & Min J 99:133-5 Ja 16 '15

#### Newfoundland

Newfoundland's mineral resources. P. B. Mc-Donald. map Eng & Min J 100:674-5 O 23 '15

#### Norway

Copper discovery in Norway, A. D. Udhany, Eng & Min J 99:322 F 13 '15

Grong copper and pyrites mines of Norway. A. D. Udhany. il map Eng & Min J 99:889-92 My 22 '15

#### Oklahoma

Copper deposits in the Red Beds of south-western Oklahoma, A. E. Fath. il Econ Geol 10:140-50 F '15

See also Coal See also Coal mines and mining -Okla-homa; Petroleum—Oklahoma

# Ontario

Certain mineral occurrences in the Worthington mine, Sudbury, Ontario, and their significance. T. L. Walker. il map Econ Geol 10:536-42 S'15

Mining in Ontario in 1914. T: W. Gibson. Eng & Min J 99:120-1 Ja 9 '15

# Oregon

Oregon mining in 1914. W. B. Hartley. Eng & Min J 99:114 Ja 9 '15

## Pennsylvania

See Coal mines and mining-Pennsylvania

# Peru

Romantic story of vanadium. C. J. Stark. il Iron Tr R 57:781-4+ O 21 '15

## Poland

Mines and smelting works of Poland, il map Eng & Min J 99:146-8 Ja 16'15

#### Russia

Kyshtim corporation and the effect of the war. Eng & Min J 100:770 N 6 '15

Mining in the Caucasus mountains, L. C. David. il Eng & Min J 99:681-3 Ap 17 '15

See also Gold mines and mining-Russia

### Santo Domingo

Copper deposits of San Cristobal. T: F. Don-nelly. bibliog il Am Inst Min E Bul 104: 1759-68 Ag '15; Discussion. 108:2473-4 D '15

#### Sardinia

Calamine mines of Sardinia. C: W. Wright, il map Eng & Min J 100:625-8 O 16 '15 Gennamari mill, Sardinia. C. W. Wright, diags Eng & Min J 100:794-6 N 13 '15

#### Siheria

Ridder mine of the Irtysh corporation. il map Eng & Min J 99:599-603 Ap 3 '15 See also Gold mines and mining -Siberia

## South Africa

Mining conditions on the Witwatersrand.
W. L. Honnold, diags Am Inst Min E Bul
104:1601-21 Ag '15
Mining in the Transvaal in 1914. H. F. Marriott. Eng & Min J 99:131-2 Ja 9 '15
Mining on the Witwatersrand, il Eng & Min J
100:320-2 Ag 21 '15

#### South America

outh America in 1914, maps Eng & Min J 99:125-30 Ja 9 '15 Sec also Coal mines and mining—South

# South Dakota

Mining in South Dakota in 1914. J. Simmons. Eng & Min J 99:113-14 Ja 9 '15

# Spitzbergen

See Ceal mines and mining Spitzbergen

# Texas

See Petroleum-Texas; Potash

# Turkey

Minerals of Asiatic Turkey, map Eng & Min J 100:715-17 O 30 '15

### United States

United States

Barite of the Appalachian states. T: L. Watson and J. S. Grasty. bibliog il diags maps Am Inst Min E Bul 98:345-90 F '15

Developing our resources. G: O. Smith. Metal Work 83:533 Ap 9 '15

Occurrence of anhydrite in the United States. A. F. Rogers. il Sch Mines Q 36:123-42 Ja '15

War and our metals. L. O. Kellogg. Eng M 49: 18-27 Ap '15

See also Potash

See also Potash

# Uruguay

Mining industry in Uruguay. R. Marstrander. Eng & Min J 99:484 Mr 13 '15

Alta activities. il Eng & Min J 99:689-90 Ap 17

Metallurgical treatment of the low-grade and complex ores of Utah. D. A. Lyon, R. H. Bradford, S. S. Arentz, O. C. Ralston, and C. L. Larson. U S Bur Mines Tech Pa 90: 1-39 '15

Mining in Utah in 1914. E: R. Zalinski, Eng & Min J 99:115-16 Ja 9 '15

See also Geology-Utah

## Wisconsin

See Zinc mines and mining

Mineville, New York Housing and sanitation at Mineville 'S. Le-fevre. il diags plans Am Inst Min E Bul 98: 227-38 F '15

Minimum wage

Failure of legislative minimum wage. Am Ind 15:11-12 Je '15 Miners' minimum wage in Yorkshire. Engineer 119:66-7 Ja 15 '15

Mining, Hydraulic. See Hydraulic mining

# Mining camps

Mine messhouse operation, Eng & Min J 100: 104 Jl 17 '15

## Mining claims. See Mineral lands

## Mining companies

Abstracts of current decisions on mines and mining, December, 1913, to September, 1914, J. W. Thompson, U.S. Bur Mines Bul 90: 12-23 '15

Abstracts of current decisions on mines and mining, October, 1914, to April, 1915. J. W. Thompson. U S Bur Mines Bul 101:16-24 '15

Mining companies—Continued

List of companies—continued
List of companies in North and Central
America with financial statistics. Eng & Min
J 100:129-30 Jl 17 '15
United States mining statutes annotated.
J. W. Thompson. U S Bur Mines Bul 94:
pt 2, 914-15 '15

See also Tonopah mining companies

Mining costs

Mining costs

Basic principles of mining cost. J. R. Finlay.
Sch Mines Q 36:193-8 Ap '15; Same. Eng & Min J 100:878-80 N 27 '15

Centrifugal mine pumps on the Rand. E. G. Izod and A. P. Rouillard, diags Eng & Min J 191115-16 Je 26 '15

Churn-drilling costs. C. H. Palmer, jr.; H. P. Bowen. Eng & Min J 99:20-1 Ja 2 '15

Churn-drilling costs of operating. G: S. Brackett. Colliery 36:132-4 O '15

Cost of an ounce of gold. P. E. Barbour. Eng & Min J 100:49-50 Jl 10 '15

Cost of drilling with well drilling machines in ore prospecting. C. H. Palmer, jr. Eng & Contr 43:202-3 Mr 3 '15

Cost of initial mining excavations. E. D. Gardner, Assn Eng Soc J 54:210-19 My '15

Cost of mine openings. E. D. Gardner, Eng & Min J 100:791-4 N 13 '15

Cost of mining in Alaska, Eng & Min J 100: 459-1 S 18 '1)

Cost of producing lead. Eng & Min J 98:1073-4

489-1 S 18 17
Cost of producing lead. Eng & Min J 98:1073-4
D 19 '14
Cost of sinking 900-ft. shaft. H. A. Linke.
diags Eng & Min J 100:845-7 N 20 '15
Details of costs at El Tigre. Eng & Min J 98:
1047 D 12 '14
Hollinger mining and milling costs. Eng &
Min J 99:908 My 22 '15
Milling at the Nipissing mines co. Eng & Min
J 99:1124 Je 26 '15
Mining costs at Goldfield. Eng & Min J 99:909
My 22 '15
Operating costs at a small Mexican mine.

Mining costs at Goldneld, Eng & Min J 99:390 My 22 '15
Operating costs at a small Mexican mine. R. H. Allen, Eng & Min J 99:1122-4 Je 26 '15
Reduction of Rand costs. Eng & Min J 99: \$96 My 22 '15
Stoping costs at iron mines, Mineville, N. Y. Eng & Min J 100:847 N 20 '15
Tests of large steam hoists. H. E. Spring. Gen Elec R 18:179-89 Mr '15
Tonopah Belmont mine. Eng & Min J 100:272

Why anthracite mining is expensive. Colliery

35:283 D '14

See also Drilling and boring (earth and rocks)—Cost; Mine haulage—Cost

Mining débris United States mining statutes annotated. J. W. Tlompson, U.S. Bur Mines Bul 94: pt 2, 933-45 '15

Mining dividends. See Mining industry and finance

Mining engineering
Backstoping with breast holes. H. K. Sherry.
il Eng & Min J 100:354 Ag 28 '15
Coal stripping in Illinois. il Colliery 36:69-72 Coal

S '15
Develop nation's oldest iron mine: Empire steel & iron co.'s Mount Hope properties.
H. M. Rocca and J. C. Stochdard, il plans Iron '17 1: 17:21 6 4 11 22 '15
Drifting with a stoper, G. E. Wolcott, diags Eng & Min J 99:860 My 15 '15
Earth tremors on the Rand, A. C. Key, Eng & Min J 100:833-4 N 20 '15

Eiderlinsky gold mines. N: T. Truschkoff, il Eng & Min J 99:1017-21 Je 12 '15

Five-hole cut. Eng & Min J 99:1083 Je 19 '15 Five-hole cut. H. A. Morrison, diags Eng & Min J 99:956 My 29 '15

Institution of mining engineers general meet-London, June 10. Engineer 119:610ing in Lo

Limits of mining under heavy wash, D. Bunting, diags plan Am Inst Min E Bul 97:1-21 Ja '15; Discussion, 101:1187-9 My '15

Mining camp without a peer; revolutionary methods at Bingham, Utah. G: F: Stratton. il Sci Am S 80:241+ O 16 '15

Mining in the Caucasus mountains. L. C. vid, il Eng & Min J 99:681-3 Ap 17 '15

Mining low-grade copper ore by Ray Consolidated, A. N. Penny, diags Eng & Min J 99: 767-70 My 1 '15

Mining methods at Park City, Utah. J. Humes, map Am Inst Min E Bul 98:479-81 F '15

Mining methods of the Arizona copper co. P. B. Scotland, diags plans Am Inst Min E Bul 98:483-96 F '15

Mining methods on Gogebic range. O. E. Olson, O. M. Schaus and F. Blackwell, diags Iron Tr R 57:735-7 O 14 '15

Mining ore from a caved stope. J. E. Harding, diag Eng & Min J 100:71-2 Jl 10 '15

Mother Lode blast. F. S. Norcross, jr. il Eng & Min J 99:931-5 My 29 '15; Abstract. Eng M 49:920-3 S '15

Notes on shrinkage stoping. E. H. Dickenson

49:920-3 S '15
Notes on shrinkage stoping. E. H. Dickenson and H. J. Volker, diags Eng & Min J 100: 875-7 N 27 '15
Oxyacetylene welding in mining. il diag Eng & Min J 99:393-7 F 27 '15
Packs, sand filling and solid pillars. Eng & Min J 100:393-4 S 4 '15
Primer on explosives for metal miners and quarrymen. C: E. Munroe and C. Hall. diags pls U S Bur Mines Bul 80:1-117 '15
Removing ore under timbered drift. H. H. Hodgkinson. diags Eng & Min J 99:657 Ap 10 '15

Hodgamson. diags Eng & Min J 99:862 My 15 '15
Sand filling, Eng & Min J 99:862 My 15 '15
Stoping methods at Fairbanks, H. I. Ellis, il
Eng & Min J 100:503-6 S 25 '15
Tom Hunter, hoisting engineer. W. O. Rogers,
il Power 39:46-8, 236-8, 372-4; 40:922-4; 42:
678-80 Ja 13, F 17, Mr 17, D 29 '14, N 16 '15
Underground crushing and loading arrangements, A. E. Hall, diags Eng & Min J 99:
192-3 Ja 23, '15
Underground mining systems of Ray consolidated copper co. L. A. Blackner, il diags
Am Inst Min E Bul 102:1249-90 Je '15
Wisconsin zinc district, H. C. George, il Eng
& Min J 100:341-4 Ag 28 '15
See also Blasting; Coal mines and mining;

& Min J 100:341-4 Ag 28 '15

See also Blasting; Coal mines and mining;
Drilling and boring (earth and rocks); Electricity in mining; Hydraulic mining; Iron mines and mining; Mine construction; Mine drainage; Mine haulage; Mine hoisting; Mine management; Mine shafts; Mine shops; Mine surveying; Mine timbering; Mine ventilation; Mines and mineral resources; Mining engineers; Mining machinery; Mining schools and education; Rock drills; Shaft sinking; Tunnels

## Classification

Indexing and filing technical literature. A. I Kenner. Eng & Min J 99:851-6 My 15 '15

#### Examinations

Examinations

Answers to examination questions for mine foreman and fire boss in various states in 1914. Colliery 35:447-50 Mr '15

Answers to examination questions for mine foreman and fire boss in various states in 1915. Colliery 36:163-5 O '15

Questions selected from those asked at an examination for mine foreman, held in Price, Utah, September 15 and 16, 1914. Colliery 35: 217-29, 276-9, 338-41 N '14-Ja '15

Questions selected from those asked at examinations for mine foreman and fire boss in various states in 1915. Colliery 36:50+, 105-7 Ag-S '15

## Power

Electric power in South Wales collieries. Elec R & W Elec'n 67:754 O 23 '15

dectrical plant of the Wakefield iron co., Wakefield, Mich. H. I. Pearl and J. Green. il plan Eng & Min J 100:349-51 Ag 28 '15 Electrical

Gas producers and concentration of power at mines. R. H. Fernald. Colliery 35:415-17 Mr '15

Hydro-electric and compressor plants at Chapin mine. L. E. Ives. Eng & Min J 99:914
My 22 '15

Power supply of the Central mining-Rand mines group. J. H. Rider, il diags Inst E E J 53:609-32: Discussion. 53:633-40, 736-43, 838-43 My 1-15, Je 15 '15

Rossiter, Pa., power plant. il Colliery 35:633-6 J1

Mining engineering-Power-Continued

Tom Hunter, hoisting engineer, W. O. Rogers il Fower 40:022-4: 41:160-2, 42:548-50 D 20:114, F 2, O 19 115

Wood as a fuel for mine power plants, E. A. Holbrook, diags Eng & Min J 99:645-7 Ap

Safety measures

Accident prevention by the New Jersey zinc. co. B. F. Tillson. Eng & Min J 98:1034-9 D

Electric shot firing in Oklahoma. Colliery 35: 408-9 Mr '15 Electrical equipment rules. Colliery 35:678+

Ji '15
Finger guard on tram car. A. E. Hall. diag
Eng & Min J 100:475 S 18 '15
Improved safety door for dump. H. H. Hodgkinson. diags Eng & Min J 100:436 S 11 '15
Permissible explosion-proof electric motors for
mines; conditions and requirements for test
and approval. H. H. Clark. il U S Bur Mines
Tech Pa 101:1-14 '15
Prevention of overwinding and overspeeding
in shafts. G. G. T. Polle. Colliery 36:20-2 Ag
'15

Respirators vs. water sprays. Eng & Min J 100:856-7 N 20 '15
Safeguarding the use of mining machinery. F. H. Kneeland. Am Inst Min E Bul 97:61-5 Ja '15; Discussion. 101:1073-4 My '15
Safety around surface tracks. Eng & Min J 99:279-80 F 6 '15
Safety rules for Wisconsin zinc mines. Eng & Min J 99:24-6 Ja 2 '15
Tentative mine-safety rules in California. L: H. Eddy. Eng & Min J 99:1048-4 Je 12 '15

See also Coal mines and mining—Safety measures; Mine signals; Mining laws; Safety

Mining engineers

American institute of mining engineers; officers, members, rules, etc. Am Inst Min E
Bul 101:sup1-190 My 15

Directory of engineers. Eng & Min J 99;sup 32-8 Ja 16'15 Engineer's life. A. R. Ledoux. Eng M 49;742-3 A 2"

Ag '15

Mining industry and finance
Chronology of mining for 1914. Eng & Min J
99:86-8 Ja 9 '15

Company reports. Eng & Min J 99:197-9; 100:
63-5 Ja 23, Jl 10 '15

Data of the world's principal mines. S. F.
Shaw. Eng & Min J 99:84-5 Ja 9 '15

First move; mining engineers as organizers.
W. G. Swart. Eng & Min J 98:164-5 Ja 16 '15

How to write mining prospectuses; satire.
Eng & Min J 99:183-4 Ja 23 '15

Influence of the European war on the mining industry of Dutch Guiana. F. B. Percival.
Eng & Min J 99:45 Mr 6 '15

Mine and metallurgical construction in 1914.
Eng & Min J 99:78-80 Ja 9 '15

Mining dividends in 1914. Eng & Min J 99:

Eng & Min J 99:78-80 Ja 9 '15 Mining dividends in 1914. Eng & Min J 99: 81-4 Ja 9 '15

SI-4 Ja 9 '15
Ore reserves of the Rand. A. C. Key. Eng & Min J 100:139-40 Jl 24 '15
Production of minerals and metals in 1914.
Eng & Min J 99:45-77 Ja 9 '15
Scandinavian mining and metallurgical notes.
Eng & Min J 99:520-1 Mr 20 '15

See also Mine accounting; Mine valuation; Mining costs

Mining institute, Canadian. See Canadian mining institute

Mining institutes

Mining institute meetings: winter meetings of the Illinois coal mining institute, the Coal mining institute of America, and the Kentucky mining institute. Colliery 35:325-30 Ja

See also Lake Superior mining institute

Mining laboratories

Mining laboratory of the Missouri School of mines, C. R. Forbes, il plan Eng & Min J 99:309-11 F 13 '15

Mining laws

Abstracts of current decisions on mines and mining, December, 1913, to September, 1914. J. W. Thompson. U S Bur Mines Bul 90:1-175 '15

Abstracts of current decisions on mines and mining, October, 1914, to April, 1915. J. W. Thompson. U S Bur Mines Bul 101:1-136 '15 Apex litigation at Tonopah. diags map Eng & Min J 99:660-1, 897-8 Ap 10, My 22 '15 Application of the apex law at Wardner, Idaho. F. T. Greene. diags Am Inst Min E Bul 101: 911-18 My '15 Arizona mining legislation. Eng & Min J 99: 611 An 2 '15

611 Ap 3 '15'
Defects of the United States mining law.
C. De Kalb. Am Inst Min E Bul 98:331-7 F
'15; Discussion. 101:1201-3; 103:1462-6 My, Jl

More Mexican mining law. Eng & Min J 100:

New mining edict in Mexico. Eng & Min J 99: 668-9 Ap 10 '15 Opinions and laws with regard to health conditions in foreign mines. A. J. Lanza and E. Higgins. U S Bur Mines Tech Pa 105: 44-7 '15

44-7 '15
Requirements for prospecting dredging ground in the Yukon, J. A. Macdonald, Eng & Min J 99:828-9 My 8 '15
Revision of mining laws urged, H. V. Winchell, Eng & Min J 100:239 Ag 7 '15
Rules and regulations for metal mines, W. R. Ingalls and others, U.S. Bur Mines Bul 75: 1-283 '15

1-285 15
Russian mining laws protect the worker, L. C. David. Eng & Min J 100:51 Jl 10 '15
Staking out mineral claims in Ontario. J. A. MacDonald. diag Eng & Min J 99:324-5 F 13 '15
Listof States mining statutes enpected

nited States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:1-1772 '15

Validity of statute regulating coal mines. Colliery 35:268 D '14
Yukon placer mining regulations, J. A. Mac-Donald. Eng & Min J 99:156-7 Ja 16 '15

See also Mine taxation; Mineral lands

Mining machinery Hydraulic mining cartridge. J. Tonge. il diags Sci Am S 79:156-8 Mr 6 '15

Manganese-steel castings in the mining industry, W. S. McKee, il diag Am Inst Min E Bul 108:2399-411 D '15; Same, Iron Tr R 57:1077-81 D 2 '15

Men and machinery of the Comstock—the combination shaft. G. W. Dickie. il Eng & Min J 98:990-4 D 5 '14

Mine motors, with special reference to electric motors. E. Drennen. Colliery 35:241-5 D'14 Multistage centrifugal and Cornish pumps in Chapin mine. L. E. Ives. il diag Eng & Min J 99:857-8 My 15'15

Safeguarding the use of mining machinery F. H. Knee!and. Am Inst Min E Bul 97:61-5 Ja '15; Discussion. 101:1073-4 My '15

Use and abuse of oil at mines. C. T. Thomsen. Colliery 35:665-8 Jl '15

Use of electricity in mining work. D: B. Rushmore. il Gen Elec R 18:527-39 Je '15

See also Conveying machinery; Electricity in mining; Excavating machinery; Hoisting machinery; Mine hoisting; Rock drills; Shoveling machines; Steam shovels

Mining prospectuses low to write mining prospectuses; satire. Eng & Min J 99:183-4 Ja 23 '15

Mining schools and education Address at testimonial dinner, H: S. Munroe. Eng & Min J 99:998-1001 Je 5 '15

New era in mining education, C: F. Willis. Eng & Min J 99:1128 Je 26 '15 School of mines in South Wales, il Colliery 35:249-51 D '14

See also Mining laboratories

Mining terms
Abstracts of current decisions on mines and mining, October, 1914, to April, 1915. J. W. Thompson. U S Bur Mines Bul 101:13-16 '15

Mining towns

Anaconda's community experiment, il Eng &
Min J 100:880-1 N 27 '15

Housing and sanitation at Mineville. S. Lefevre, il diags plans Am Inst Min E Bul 98:227-38 F '15

Mining towns - Continued

Min J 100:877-8 N 27 '15
Social improvement at Lead, S. D. Eng & Min J 100:788-9 N 13 '15

See also Miners' houses

Minneapolis, Minnesota

Railroads

Track depression at Minneapolis, diags Eng N 73:514-17 Mr 18 '15 Track depression work of the C. M. & St. P. Ry. at Minneapolis, il Ry R 57:69-72 Jl 17 Ry. at

Water supply

Minneapolis loses filter infringement suit. Eng Rec 72:191 Ag 14 '15

Minneapolis, St. Paul & Sault Ste. Marie railway

Twenty-seventh annual report. map Ry Age 59:886, 925-6 N 12 '15

Minneapolis institute of arts

Beginnings of the recently opened Institute of arts. E. H. Hewitt. Am Inst Arch J 3: 85-6 F '15

Minnesota electrical association 8th annual convention, St. Paul, March 23-25. Elec R & W Elec'n 66:637-41 Ap 3 '15

Minnesota electrical contractors' association Semi-annual convention, Minneapolis, Minn., Jan. 27. Elec R & W Elec'n 66:246 F 6 '15

Minnesota state association of master plumbers 20th annual convention, St. Paul, Feb. 23-24. Dom Eng 70:278-80 F 27 '15

French process for electroplating mirrors with copper. il Elec R & W Elec'n 66:922-3 My 15

Protecting silvered mirrors by copper plating. il diag Sci Am S 79:28 Ja 9 '15

Mississippi delta
Continual subsidence of the Mississippi delta.
E. L. Corthell. Eng N 73:597 Mr 25 '15

Mississippi river

Experimental Mississippi river levees indicate possibility of eliminating seepage. C. O. Sherrill, il plan Eng Rec 71:552-4 My 1 '15 Methods of creating and maintaining channels at mouths of fluvial and tidal rivers. E. L. Corthell. Eng Rec 71:42 Ja 9 '15 Mississippi river problem. G: B. Cleveland, jr. Sci Am 112:83 Ja 23 '15 Mississippi river; written for the new International encyclopedia. J. W. Woermann. bibliog Assn Eng Soc J 55:37-66 S '15 Plans for a typical condition of Mississippi bottom land drainage. map Eng & Contr 43: 490-1 Je 2 '15 Port improvements along the Mississippi and

Port improvements along the Mississippi and Ohio rivers. Eng N 73:1066-8 Je 3 '15 Water terminals on the Mississippi river. Eng N 73:507 Mr 11 '15

Missouri, Kansas & Texas railroad Statistics for the fiscal year ended June 30, 1914. Ry Age 58:82-3 Ja 15 '15

Missouri Pacific railroad

Abstract of annual report, map Ry Age 59: 793-5 O 29 '15

Semi-centennial of the Missouri Pacific. Ry R 57:433 O 2

Missouri public utilities association Convention cruise, day 27-30. Elec R & W Elec'n 66:1052-4 Je 5 '15

Missouri river

issouri river improvement work may be stopped. H. Deakyne, Eng N 74:409 Ag 26 Missouri

Missouri river navigation. Eng N 74:561-2 S 16

Proposed Missouri-Meramec river hydro-electric power development: committee report. Assn Eng Soc J 55:32-6 Jl '15

Missouri School of mines
Mining laboratory of the Missouri School of
mines, C. R. Forbes, il plan Eng & Min J
99:309-11 F 13 '15

Mitchell, Mt.
Destroying Mt. Mitchell. R. Pullman. il Am
For 21:83-93 F '15

t. Mitchell trail. H. W. Plummer and N. Buckner. il Am For 21:94-9 F '15

Mnemonic symbols. See Symbols, Mnemonic

Model towns

odel towns
Details of an interesting plan for developing
a large community settlement. il Iron Tr R
57:98 Jl 8 '15
Factory city beautiful at low cost, Badin,
N. C. il plans Iron Age 95:782-6 Ap 8 '15
Model city near new steel plant; Morgan Park.
R. V. Sawhill. il plan Iron Tr R 57:647-9 S
30 '15

Modeling

See also Plaster casts

Models

Model experiments and the forms of empirical equations. E. Buckingham. Am Soc M E J 37:531-2; Discussion. 37:532-4 S '15 Model record of distribution of construction plant. il Eng N 74:218-19 Jl 29 '15 Models, properly designed, show correctly performence of days and turbines. P. F. Cront.

formance of dams and turbines. B. F. Groat. Eng Rec 72:377-8 S 25 '15

See also Locomotives-Models; Mine models; Panama canal—Model

Models, Geographical

Table-top geography; hints on the construction of simple models. P. Collins. il Sci Am 112:270 Mr 20 '15

Models, Mine, See Mine models

Mohair

Mohair fabric, il Textile World 49:571 Ag

Moisture of the air. See Humidity

Molding. See Foundry practice

Molding machines

Automatic molding machine. il Iron Age 95: 241 Ja 28'15 B and B molding machine. il Metal Ind n s molding machine, il Metal Ind n s

B and B molding machine. If Metal Ind n s 13:296 JI '15
Compressed air moulding machine, il diags Engineer 119:189-90 F 19 '15
Electrically operated joit roll-over molding machine, il Iron Age 96:675 S 23 '15
Foundations for jar-ramming molding machines. E. S. Carman, il diags Foundry 43: 420-3 O '15; Same, Iron Tr R 57:1180-3 D 16

Getting the most from molding machines. P. R. Ramp. diags Iron Age 96:1-4 Jl 1 '15 Home-made molding machines. W. H. Parry. Metal Ind n s 13:155 Ap '15 How sewing machine parts are molded and cast. H. C. Estep. il Foundry 43:345-51 S '15 the content of the second service of the second second service of the second second service of the second 
ow to make automobile engine castings. il Foundry 43:291-4 Ag '15 olt and squeezer molding machine. il Iron Age 96:1100 N 4 '15 Jolt and

Jolt stripping plate machine. il Iron Tr R 56: 225+ Ja 28 '15

Molding and casting large tunnel segments.
Li J. Josten. il diags Foundry 43:356-9 S

Molding machines and pattern mounting. J. F. Ervin. Iron Age 95:721-4 Ap 1 '15 Osborn molding machine. il Foundry 43:79-80

Preumatic rock-over molding machine, il Iron Age 96:751 S 30 '15 Pneumatic vibrator for molding machines, il Iron Age 96:750 S 30 '15 Squeezer type molding machine, il Iron Age 95: 1166 My 27 '15

Molding sand. See Sand, Foundry

Molecular movements. See Brownian movements

Molecular movements. See Brownian movements
Molecular weights
Interpretation of molecular weight results
from measurements on solutions. W. E. S.
Turner. Am Chem Soc J 37:2063-4 S '15
Molecular weight of sodium carbonate and the
atomic weight of carbon referred to silver
and bromine. T. W. Richards and C: R.
Hoover, Am Chem Soc J 37:95-107 Ja '15
Molecular weight of sodium sulfate and the
atomic weight of sulfur. T. W: Richards and
C: R. Hoover. Am Chem Soc J 37:108-13 Ja
'15

Molecules
Atoms, molecules and electrons. N. W. Rake-straw. Sci Am S 80:254-6 O 16 '15

Molecules -Continued

Some aspects of the atomic theory, F: Soddy, Sci Am S 80:178-9 S 18 '15 Theory of valency and molecular structure, Will C Arsen, diags Am Chem Soc J 36: W: C. Arsem. 1655-75 Ag '14

See also Atoms; Molecular weights; Opti-cal rotation; Stereochemistry

Moline, Kansas

Water supply

Underflow water-supply at Moline, Kan. W. L. Benham. Eng N 73:925-6 My 13 '15

Molybdenite

Canadian molybdenite deposits. W. H. Smith. Eng & Min J 99:271-2 F 6 '15 Manufacture of ferro-alloys in the electric furnace. R. M. Keeney. U S Bur Mines Bul 77:146-51 '14

Molybdenum

Atomic weight of molybdenum. J: H. Müller, diags Am Chem Soc J 37:2046-54 S '15 Molybdenum and copper. C. Vickers. Foundry 43:344+ S '15 Separation of tungsten from molybdenum, E: E. Marbaker, Am Chem Soc J 37:86-95 Ja '15

Molybdic acid

Molybdic acid recovery. C. G. Armstrong. J Ind & Eng Chem 7:764 S '15 Recovery of molybdic acid. W. D. Brown. J Ind & Eng Chem 7:213-14 Mr '15; Same. Iron Tr R 56:1058 My 27 '15

Moments of inertia
Moment of inertia of a rectangle by elementary method. W: H. Gravell. Eng N 73:

Monazite

Brazilian monazite. Eng & Min J 100:759 N 6 '15

Monazite, thorium, and mesothorium. K. L. Kithil. bibliog flow sheet U S Bur Mines Tech Pa 110:1-30 '15
Thorium; an American industry—no danger of a shortage. T. Owens. Am Gas Light J of a shortage. T. 103:187-8 S 20 '15

Monel metal

Casting monel metal. Mach 21:584 Mr '15
Failure of the hull of the Sea Call. il Met &
Chem Eng 13:884 D 1 '15
Galvanic corrosion damages hull of yacht. Eng
N 74:522-3 S 9 '15
Monel metal boat. il Metal Ind n s 13:313 Ag

Monel metal in water-works and other engineering service. Eng N 73:890 My 6 '15

Money

See also Credit Monochloroacetic acid

Action of monochloroacetic acid on semi-carbazide and hydrazine. J. R. Bailey and W. T. Read, Am Chem Soc J 36:1747-66 Ag 14

Monopolies

Clayton act and the exclusive agent. E. J. Buckley. Metal Work 82:835 D 25 '14 Private monopoly and present public opinion. G: O. Smith. Metal Work 83:924+ Je 25 '15

See also Trusts, Industrial

Monorailways. See Suspended railways

Monotype

Modern methods of composing type, il Sci Am S 80:324 N 20 '15 Monotype accounting problems. C. D. Bollin-ger. Inland Ptr 55:473-5 Jl '15

Monotype in a trade plant, J. H. Walden, Inland Ptr 56:207-8 N '15

gns of the times in composing-machinery. C. D. Bollinger. Inland Ptr 56:184-6 N '15

Monroe doctrine
Monroe doctrine and Latin-American commerce. L. G. Valentine. Am Ind 15:18-19+

Montana

Industries and resources

Bull mountain coal field. J. P. Rowe and R. Wilson, maps Colliery 36:7-11, 74-9 Ag-S

Probable oil and gas in Montana. J. P. Rowe. Eng & Min J 99:647-9 Ap 10 '15 See also Mines and mineral resources—

Montana

Montana power company
System of the Montana power company,
M. Hebgen, il map Elec W 65:1535-44 Je 12

Montgomery Ward & co. Kansas City building of Montgomery Ward & co. il plan Arch & Bldg 47:35-40 Ja '15

Montreal, Canada

Bridges

Late Thomas C. Keefer and the plans for the Victoria bridge at Montreal, Eng N 73:179-80 Ja 28 '15

Galleries and museums

Montreal art gallery. T: W. Ludlow. il plans Arch Rec 37:132-48 F '15

Railroads

Completing the Mount Royal tunnel into Montreal il diags plan Ry Age 59:857-60 N

Montrose, Colorado

Water supply

Second rebuilding of the water-works of Mon-trose, P. W. Pinkerton, Eng N 73:883-4 My 6 '15

Monuments

War monuments. Am Inst Arch J 3:151-2 Ap

See also Inscriptions

Moorestown, New Jersey

Sewerage

Converting old septic tank and contact beds into two-story tank and sprinkling filters at Moorestown. A. Potter. il plans Eng & Contr 42:473-6 N 18 '14

Morgan building, New York
Banking house of J. P. Morgan & co. il plans
Arch & Bldg 47:5-14 Ja '15

Morgan Park, Minnesota Model city near new steel plant. R. V. Saw-hill. il plan Iron Tr R 57:647-9 S 30 '15

Morris, John Lewis Professor of practical mechanics, Sibley col-lege, 1868-1904, D. S. Kimball, por Sibley J 29:315-19 Je '15

Morris, William, 1834-1896 Literature of typography, H: L: Bullen. por Inland Ptr 55:61-2 Ap '15

Morristown, New Jersey

Railroads

New passenger station of the D. L. & W. R. R. il plans Ry R 55:735-41 D 19 '14

Sewage-works of Morristown, C. Potts. il diags plan Eng N 73:1105-8 Je 10 '15

Mortality

Diseases dangerous at different periods of life. Sci Am'S 79:149-50 Mr 6 '15 Why do men over forty break down? C: F. Bolduan. Sci Am 113:63 J1 17 '15

Mortar

Comparative tests of hardness, toughness and strength of mortar; diagrams. C. H. Moore-field and J. T. Voshell. Eng & Contr 44:270 O 6'15

Effect of fineness of sand and of clay and loam on the strength of mortar, F. L. Roman. Eng & Contr 43:403-6 My 5 '15

How consistency and age affect strength of mortar, Eng Rec 72:484 O 16 '15

Lime and Portland cement. Sci Am S 80:343 N 27 '15

Manufacture of mortar. Sci Am S 80:332 N

Mixture of mortar for laying up block walls. Concrete Cem 6:39 Ja '15 Routine tests for determining strength of mortars, H. Perrine, il Eng Rec 71:85 Ja 16 '15

-Continued

ortar—Continued
Sand for concrete and cement mortar should
have jump in grading. R. H. McNeilly.
Eng Rec 72:659-62 N 27 '15
Tests to determine the effect of normal and
low temperatures on the strength of cement
mortar. Eng & Contr 43:196-7 Mr 3 '15

See also Cement; Lime

Mortars (ordnance)

Austria's famous Skoda mortars, il Sci Am 113:12 Jl 3 '15

Rifles and mortars, il diags Sci Am 111:472-3 D 5

Mosquitoes

Malaria and the transmission of diseases. R. Ross. Sci Am S 79:50-1 Ja 23 '15 Malarial mosquitoes as the food of bats, C: H. R. Campbell. il Sci Am 113:425 N 13 '15

Moths

lour moths and army rations. We craft, il Sci Am S 80:333 N 20 '15

Motion

Apparatus for demonstrating Newton's laws. H. W. Harmon. diag Sci Am S 79:42-3 Ja H. W 16 '15

See also Mechanics

Motion pictures. See Moving pictures

Motion study

Eliminating waste motion in molding. R. E. Kennedy and J. C. Pendleton. il Iron Age 94:662-4 S 17 '14; Same. Ind Eng 14:423-6 N

Industrial coach; how the efficiency engineer studies the human machine. il Sci Am 113: 402-2 N 6 '15

Motion study for the crippled soldier. F. B. Gilbreth. il Am Soc M E J 37:669-73; Discussion. 37:673-5 D '15

Motor barges

Development of inland water transportation. J: H. Bernhard. Eng Rec 72:332-4 S 11 '15 Modern self-propelled barge for the Missis-sippi river, il plans Int Marine Eng 20:497-9

M 10 Motor boat Kern. il plan Int Marine Eng 20; 489 N '15 New Mississippi river barges with deck gan-tries. J: M. Sweeney. Eng N 74:668-9 S 30

Performance of the shallow-draft producer-gas barge Richmond of the Augusta-Savannah barge line. il Int Marine Eng 20:274 Je '15

Motor boats

Application of electricity to propulsion: fiftyoplication of electricity to profusion; inty-foot motor boat equipped with electric driv-for experimental purposes. W: T. Donnelly, il diags Int Marine Eng 20:204-8 My '15 bat engines, Metropolitan S. A. E. topic. Horseless Age 35:446 Mr 31 15

Horseless Age 35:446 Mr 31 15
Diesel motor tug Chickamauga. G: E. Nicholson. il Int Marine Eng 20:493-5 N '15
Motor fire float Delta II. il Int Marine Eng 20:493-8 N '15
Novel idea in boat construction. il Sci Am 113:269 S 25 '15

See also Motor barges

Motor buses

Auto-bus as s as an auxiliary to interurban rail-A. W. Leonard, il Elec Ry J 46:570-1 ways. A

S 18 1b Auto-bus in London, H. H. Gordon, Elec Ry J 45:888 My 8 '15 Better bodies on Paris motor buses, il Auto-mobile 32:360 1 20 15 Cost of bus operation, il Elec Ry J 45:414-17 F 27 '15

Low two-story motor busses with novel seating system introduced in Vienna. diags Automobile 32:157-9 Ja 21 '15

Novel form of motor bus for interurban service between Minneapolis and St. Paul. il Elec Rv J 46:29-30 Jl 3 '15; Eng N 74:56 Jl 8 '15; (Highway chair car). Sci Am 113:228 S 11 '15

ne-man, pay-enter motor bus design. diags Automobile 32:641 Ap 8 '15 One-man,

Operating costs for omnibuses in Sheffield, England. Elec Ry J 46:673 O 2 '15

Stepless bus with electric transmission. il Automobile 32:159 Ja 21 '15

Stepless omnibuses in New York, il Sci Am

Stepless offinituses in few total 11:495 D 12 '14
Testing the equilibrium of double-deck buses at Vienna, il Elec Ry J 44:1308 D 12 '14
Well construction of Vienna auto-bus, il diags
Elec Ry J 45:49 Ja 2 '15

See also Electric buses; Jitney buses

Motor buses, Steam

otor buses, Steam
Fixed calorific standard—a new use for gas
coke, N. H. Humphrys. Am Gas Light J
102:73 F 1 '15
New coke fired road vehicle. il diags Engineer
119:526-7 My 28 '15; Abstract. Eng M 49:
740-1 Ag '15

Motor cars. See Automobiles; Electric vehicles; Motor trucks

Motor cars (railroad)
Efficiency of motor cars for section forces.
G. R. Morrison. Ry Age 59:527-8 S 17 '15;
Same. Ry R 57:345-6 S 11 '15
Gasoline motor car on rails in the Pacific northwest. il Elec Ry J 46:1080 N 27 '15

Inspecting steam railroads with a gasoline car. il Sci Am 112:588 Je 12 '15
Motor cars for railways. Sci Am S 80:285 O 30 '15

30 '15
Petrol rail coach engine. diags Engineer 119:
426-7 Ap 30 '15
Railway inspection car follows automobile design. il Automobile 32:813 My 6 '15
Record-breaking gasoline motor car. il Elec
Ry J 45:1215-16 Je 26 '15
Simplex rail coach. il Engineer 119:386-8 Ap

15

16 '15 Thomas transmission rail coach, il diags Engineer 120:42-3 Jl 9 '15 300-hp. gasoline motor car for fast passenger service. il Eng N 73:1094-5 Je 3 '15 Value of motor cars. W. R. McKeen. Ry Age 59:816-17 O 29 '15

Storage battery

Large storage battery car for Cambria & Indiana railway. il Elec Ry J 44:1356 D 19 '14

Long Island railroad adopts light, steel trailers, il diags Elec Ry J 46:136-8 Jl 24 '15

Motor cars (street railroad)

Storage battery

Street railway service being inaugurated in Miami, Fla., with storage-battery cars. il diag Elec Ry J 46:920-1 O 30 '15

Motor chairs. See Wheel chairs, Electric

Motor cycles

Location of motorcycle power plant troubles: chart. V: W. Pagé. Sci Am 112:314-15 Ap 3 chart.

Machining motor cycle parts, D. T. Hamilton, il Mach 21:377-80 Ja 15 Rise of the motorcycle, Sci Am 112:581+ Je 5 15

neet metal side car attachment. il Metal Work  $84:405~\mathrm{S}$  24 '15 Sheet metal

Motor cycles in war Motorcycling under fire. Sci Am 112:42 Ja 2

War uses of the motorcycle: cycle ambulance and motor machine gun. il Sci Am 112:138+ F 6 '15

F 6 '15

Motor-generators
Direct-current three-wire systems. G. Fox.
diags Power 41:505-8 Ap 13 '15
Hertner vertical charging set. il Elec R & W
Elec'n 66:699 Ap 10 '15
Large motor-generator in San Francisco. il
Elec R & W Elec'n 66:1165-6 Je 19 '15; Elec
W 65:1567 Je 12 '15
Motor-generators versus rotary converters.
E. Friedlænder. Power 42:458 S 28 '15
New motor-generator set for charging automobile batteries. il Elec R & W Elec'n 67:
383 Ag 28 '15; Elec W 66:485 Ag 28 '15

Motor amnibuses. See Motor buses

Motor omnibuses. See Motor buses

Motor plows

Coming of the motor plough, il diag Engineer 120:361-4, 408-10 () 15, 29 '15

Ford tractor plows 5 to 10 acres per day at a cost of \$3.10, Automobile 33:584 S 23 '15

Motor plough, il diags Engineer 119:386 Ap 16 '15; Same, Automobile 32:812 My 6 '15

Motor ships

otor ships
Diesel engine applied to marine purposes.
C. Kloos, il diags Power 12:734-8 N 23 15
Installation of 120 horsepower Bolinder oil
engine in pilot schooner Gracie S, il plans
Int Marine Eng 20:158-60 Ap 15
Large Diesel engined ships for marine naviga-

and their economic possibilities; let. W: Scholz. Am Soc M E J 37:228abstract. V

30 Ap 15 Motor ship Gallia, il diags Int Marine Eng 20: 420-1 S 15 Motor ship Tongking, il Int Marine Eng 20: 64-5 F 15 Motorship Pacific, Int Marine Eng 20:516 N

Performance of Diesel-engined motor ships. Int Marine Eng 20:381 S '15 Performance of motor ships. Engineer 119: 65-6, 322 Ja 15, Ap 2 '15 Revival of the reversible blade propeller. il diags Engineer 119:295-7, 306 Mr 26 '15 Trials of the submarine tender Fulton: first United States naval vessel' to be fitted with Diesel engines. il Int Marine Eng 20:76-8 F

Werkspoor motor ships in service. T. O. Lisle. Int Marine Eng 20:23-6 Ja '15 See also Diesel engines, Marine; Gas and oil engines, Marine; Motor boats

Motor spirit

Low-temperature coal distillation. F. M. Per-kin. J Ind & Eng Chem 7:352 Ap '15 Two improvements devised for motor spirit process. diag Automobile 32:533 Mr 25 '15

Motor truck industry

Beginning of a new epoch in the motor truck industry. Sci Am 112:396 My 1 '15

Demonstrations—necessity and charges. J. C. Ayers. Horseless Age 35:240-3 F 17 '15

Directory of truck makers; 253 vehicles, their makers and capacities. Automobile 32:62-4 irector, makers a

Ja 14 Field f 750,000 trucks. Automobile 31:1169 for 4 '14

D 24 '14
Influence of war on industrial transportation. Sci Am 113:452+ N 20 '15
Metropolitan section of S. A. E. discusses truck makers' obligations to customers. B. B. Bachman. Automobile 32:772-3 Ap 29 '15
Motor truck problem. Sci Am 112:611 Je 19 '15
Résumé of papers read before convention of motor truck manufacturers and dealers at Detroit. Horseless Age 35:606-8 My 5 '15
Truck makers hold successful convention. Horseless Age 35:626-8 My 12 '15
Truck makers to decide on standard service policy. L. V. Spencer. Automobile 32:841-4
My 13 '15

policy. L. V. Spencer, Automobile 32:841-4 My 13 '15 Trucks and the traffic engineer, Automobile 31:1030-1 D 3 '14

Motor truck trailers Increasing truck efficiency with trailers. Miller, Horseless Age 35:802-3 Je 16 '15

Motor trucks
Bingham 1250 delivery car. il Horseless Age
34:326 Ag 26 '14
Chase water-cooled and worm-driven truck, il
diag Automobile 33:118-19 Jl 15 '15
Chase worm-drive trucks, il florseless Age
35:440 Mr 31 '15
Commerce delivery, il Automobile 33:282-3 Ag

Convenient meter installation runabout and cost of its operation. H. A. Hippler. il Elec W 66:415-16 Ag 21 '15
Detroit package wagon enters field. il Automobile 33:506-7 S 16 '15
Detroit package wagon in three body types. il Horseless Age 36:330-1 O 1 '15
Electric system on Reo 34-ton truck. il diags Automobile 33:378-9 Ag 26 '15
Four chassis for transit trucks. il Automobile 31:111 D 17 '14
Four-ton petrol motor lorry. il diag Engineer 118:507 N 27 '14
Front drive, bottom dump motor truck. il Good Roads n s 9:241 Je 5 '15
Hall motor truck. il Horseless Age 35:504-5 Ap 14 '15
Hall truck enters field. il Automobile 32:768-9

Hall truck enters field, il Automobile 32:768-9 Ap 29 '15 Indiana three-quarter-ton truck, il Horseless Age 35:605 My 5 '15

International harvester truck; new model. il Horseless Age 35:271 F 24 '15
International 1000 lb. truck. il Horseless Age 36:332-3 O 1 '15
International 1-ton truck. il Horseless Age 35: 541 Ap 21 '15
Jeffrey Quad truck at Victor, Colo. Eng & Min J 100:682 O 23 '15
Kearns one thousand pound truck. il Horseless Age 36:374 O 15 '15
Kissel adds %- to 1-ton truck. il Automobile 33:982 N 25 '15
Maintaining concrete and brick roads in Illi-

Maintaining concrete and brick roads in Illinois, B. H. Piepmeier, il Eng N 74:310-13

Motor truck and the road; who should pay the road tax? J: S. Harwhite, il Sci Am 113:66+

road tax? J: S. Harwhite. il Sci Am 113:66+ J1 17 '15
Motor truck notes and queries. Sci Am 113: 345 O 16 '15
1915 truck chassis more flexible. Automobile 32:60-1 Ja 14 '15
Packard worm-drive trucks. il Automobile 32: 108-9 Ja 21 '15
Packard worm-driven trucks: technical details. il Horseless Age 35:101-2 Ja 20 '15
Performance of gas and electric trucks. W: J. Miller and S. G. Thompson. Automobile 33:761-2 O 21 '15
Remodelling cars for commercial uses, diag Horseless Age 34:809-10 D 2 '14
Republic trucks—simplicity. diags Automobile 33:656-7 O 7 '15
Republic two-ton internal gear drive truck. il Horseless Age 36:46 Jl 14 '15
Stearns-Knight five-ton truck, il Horseless Age 36:25 Jl 7 '15
Three-ton petrol lorry, il diags Engineer 119: 68-9 Ja 15 '15
United motor truck models. il Automobile 32: 534-5 Mr 25 '15
Weak spots brought out in German trucks. Automobile 33:615 S 30 '15
White power-hoisting coal body, il Automobile 32: 423 Mr 4 '15

Automobile 33:515 S 30 15
White power-hoisting coal body, il Automobile 32:423 Mr 4 '15
Why local regulations of motor truck traffic are objectionable. Horseless Age 35:407-9
Mr 24 '15 Worm

Form drive on new Locomobile 3 and tonners, il Automobile 31:1264 D 31 '14 trucks:

See also Automobiles; Electric trucks; Loading and unloading; Motor truck indus-try; Tires (automobile)

# Axles

5-ton Sheldon axle with ball bearing worm. iI diag Automobile 33:572 S 23 '15

# Bodies

Bodies feature of truck exhibits, il Automobile 32:444-5+ Mr 11 '15

## Cost of operation

Cost of operation

Chicago autotruck service reduces hauling charges. Eng Rec 72:299-300 S 4 '15

Comparisons between horse, gasoline and electric delivery costs; summary of electric vehicle study by Massachusetts institute. H. F. Thomson. Elec R & W Elec'n 67: 874+ N 6 '15

Cost data for auto trucks. E. N. Bryan. Eng Rec 71:211-12 F 13 '15

Cost of handling material with motor versus horse-drawn equipment. H: F. W. Arnold. Eng M 50:28-32 O '15

Cost of motor-trucking by Chicago water works in 1914. Eng & Contr 44:162 S 1 '15

Economy of heavy motor trucking for Lynn, Mass, water works. D. A. Sutherland. Eng & Contr 44:416 N 24 '15

Extent and cost of use of motor trucks in municipal refuse collection service. S: A. Greeley. Eng & Contr 44:286-7 O 13 '15

Garbage collection studies in Chicago justify continued use of horses. Eng Rec 72:52-3 JI 10 '15

10 '15 Motor truck operation and accounting. C: A. Dickens. il Munic Eng 49:46-9, 130-6, sup 25+ Ag, O-N '15

Motor trucks and business efficiency. il Metal Work 83:50-2 Ja 1 '15

Motor vehicles in water-works service at Los Angeles. B. A. Heinly. Eng N 73:861-3 My 6 '15

Motor trucks—Cost of operation—Continued
Operating costs of two Cincinnati factories, in
comparison with horse-drawn vehicles. Iron
Age 96:223 J1 22 '15; Same cond. Ind Eng
15:104 S '15
Shen-continued

15:104 S '15
Shop equipment and motor trucking costs, meter division of Milwaukee water works. Eng & Contr 43:334-5 Ap 14 '15
Underestimating the cost of motor trucking. E. N. Bryan. Eng & Contr B:210 Mr 16 i5
Utilization of the motor truck in highway work, il Good Roads n s 9:171-9 My 1 '15 See also Electric trucks-Cost of operation

#### Fenders

Dummies play important part in fender tests. H: A. Allen, C. E. Fitch and H. Borland, il Eng Rec 72:571 N 6 '15

#### Gearing

Another viewpoint; defense of internal gear drive. V. V. Torbensen. Horseless Age 35:651 My 12 '15

My 12 '15
Calculation of hollow propeller shafts, diag
Horseless Age 36:369 O 15 '15
Hotchkiss drive for trucks, A. M. Laycock,
diags Automobile 33:833-4 N 4 '15
Internal gear drive, C. C. Hancock, Horseless
Age 35:886 Je 30 '15
Internal gear drive, C. H. Taylor, Horseless
Age 35:566-7 Ap 28 '15
Internal gear drive vs. worm drive, A. F.
Mais, Horseless Age 35:852; 36:84 Je 23, Jl 21
'15

Worm drive for motor trucks. Horseless Age

Worm drive vs. internal gear drive. C. C Hancock. Horseless Age 35:650-1 My 12 '15

## Loading

See Loading and unloading

## Management

Increasing motor-truck efficiency. Eng N 73:
 1179-80 Je 17 '15

# Manufacture

Drill fixtures for motor truck parts. C. T. Schaefer, diags Horseless Age 34:818-19 D 2

"14 Machining motor truck sprockets and drums. A. A. Dowd. diags Horseless Age 35:436-9 Mr 31 '15
Study of an axle shaft for a motor truck. J: Younger. il diags Am Soc M E J 37:435-9 Ag '15; Same. Iron Tr R 56:1311-14 Je 24 '15; Same cond. Horseless Age 36:1424 Ag 1 '15; Abstract. Iron Age 96:27 J1 1 '15; Discussion. Am Soc M E J 37:439-40 Ag '15

### Price lists

Business man's reference table of commercial vehicles. Sci Am 112:28+ Ja 2 '15 Price classification of 1915 trucks. Automobile 22:65-7 Ja 14 '15

# Safety devices

See also Motor trucks-Fenders

### Service stations

See Automobile service stations

# Specifications

Gasoline motor trucks for 1915; specifications of 377 American commercial vehicle chassis. Automobile 32:68-79 Ja 14 '15

# Springs

Care of truck springs. J: G. Utz. Automobile 31:1122-3 D 17'14

# Tires

See Tires (automobile)

### Wheels

Wheels
English pressed steel truck wheel, diags Automobile 32:421 Mr 4 '15
Machining steel motor truck wheels, A. A. Dowd, diags Horseless Age 34:883-5 D 16 '14
Need for reducing the standard wheel and tire sizes for trucks, P. W. Kerr. Elec R & W Elec'n 67:712 O 16 '15
Wheels for commercial vehicles. T: Clarkson, il diags Automobile 32:189-91 Ja 28 '15; Abstract, Horseless Age 35:175-6 F 3 '15

Standard Metry rephiles, Wheels

See also Motor vehicles-Wheels

Motor trucks, Military
Dennis subsidy lorry, il plan (supp) Engineer
119:576-8, 593-4 Je 11-18 '15
Example of four-wheel drive truck used for

war purposes—rules governing the require-ments, il diag Automobile 31:1120-1 D 17 '14 (akes of automobile trucks used by the United States army, Automobile 33:245 Ag 5

'15 Motor searchlights with the British-French forces, il Elec R & W Elec'n 67:239 Ag 7 '15 Motor truck in modern military service, il Sci Am S 79:280-2 My 1 '15 Motor trucks and modern warfare. J. Brinker, il Sci Am 113:398-9+ N 6 '15 New American military truck; Jeffery machine drives, steers and brakes on four wheels, J: W. DeCou, il Eng M 49:746-9

Ag '15
Saving trucks at the front in France. W. F. Bradley. il Automobile 32:51-5+ Ja 14 '15
Sham warfare motor equipment test. J. E: Schipper. il Automobile 33:422-5 S 2 '15
Type of truck for military use. J. W. DeCou. Horseless Age 35:800 Je 16 '15
U. S. army needs motor transports. J. E: Schipper. il Automobile 33:231-3 Ag 5 '15
War trucks arrive in France. W. F. Bradley. il Automobile 32:226-31 F 4 '15

Motor trucks, Municipal
Baltimore municipal White truck has wireless
equipment. il Automobile 31:1023 D 3 '14

Nee also Electric trucks, Municipal; Street cleaning apparatus, Motor

Nee also Electric trucks, Municipal; Street cleaning apparatus, Motor

Motor trucks in construction work
Cost of motor-truck hauling depends on conditions. W: Collins, jr. Eng N 74:653 S 30 '15
Demonstration of gravel road construction using motor truck and road grader. R. L. Morrison. il Eng & Contr 44:205 S 15 '15
Excavating aggregates with drag line and hauling by motor truck on Indiana concrete road work. S. E. Bates. il plans Eng & Contr 44:231-3 S 22 '15
Handling 400 tons of stone per day with auto trucks. Eng Rec 70:621-2 D 5 '14
Hauling gravel with motor truck and trailers; a service test in concrete road construction. il Eng & Contr 42:335-6 D 9 '14
Hauling heavy water pipes. E. C. Miles. il Munic J 38:97-9 Ja 28 '15
Hauling material on the North side reservoir, Pittsburgh. Eng N 73:173-4 Ja 28 '15
More use of motor trucks for hauling structural steel. D. P. N. Little. il diag Eng N 74:554-5 S 16 '15
Motor truck and the contractor. B. A. Gramm. Munic Eng 49:180-1 N '15
Motor truck operation and accounting. il Munic Eng 49:46-9 Ag '15
Motor trucks for heavy structural steel. W: Collins, jr. il Eng N 74:174-6 J1 22 '15
Pipe hauling by motor truck. W. L. Vennard. il Munic J 38:255 F 2-5.5
Utilization of the motor truck in highway work, il Good Roads n s 9:171-9 My 1 '15

Motor trucks in freight handling
Methods of handling L. C. L. outbound freight.

Motor trucks in freight handling
Methods of handling L. C. L. outbound freight.
E. H. Lee. Ry Age 57:1182-4 D 25 '14; Conclusions. Eng Rec 71:52 Ja 9 '15
Trucking l. c. l. freight. Ry R 56:352-3 Mr 13

Motor trucks in ore haulage Motor-truck ore hauling in California. Eng & Min J 100:790 N 13 '15 Motor trucking iron ore; abstract. J: Younger. il Eng & Min J 99:242 Ja 30 '15

Motor vehicles

Motorized police department. K. C. Cardwell.

il Munic J 38:386-17 Mr 11 15

Practicability of applying same spring elements to motor vehicles of all classes, diags

Automobile 32:854-6+ My 13 '15

See also Ambulances; Automobiles; Cyclecars; Electric vehicles; Fire apparatus, Motor; Jitney buses; Motor buses; Motor trucks; Tractors; Unicycles

Heavy motor vehicles—wheels and weights. W. W. Beaumont. Engineer 119:523 My 28 '15

Motorcycles. See Motor cycles Motors

Sce also Aeroplane motors; Dynamos; Electric motors; Engines; Gas and oil en-gines; Machinery; Steam engines; Turbines; Water wheels; Windmills

Mountain railroads

Furka railway; a new Alpine railway from the Rhône to the Rhine, A. Gradenwitz, il Sci Am S 79:344-5 My 29 '15

Am S 79:344-5 My 29 '15 Great railway electrification project. il map Sci Am S 79:56-8 Ja 23 '15 Hamilton electric incline railway, il Elec Ry J 46:115-16 Jl 17 '15; Same. Eng N 74:49-51 Jl 8 '15; Same. Ry R 57:213-14 Ag 14 '15 Hamilton incline railway, il Munic J 39:41-2 Jl

Looping the loop in the Alps. J. F. Springer, il Sci Am 111:504-5 D 19 '14 Mountain railway electrification. F. Castiglioni. Elec Ry J 46:858-60 O 23 '15

See also Cable railroads

Mountain roads

Alpine roads Alpine roadbuilding in the Hudson river valley, il Eng N 74:1025-6 N 25'15
Build scenic highway up Pike's Peak, il Eng Rec 72:504-6 O 23'15
Connecting roads to mountain parks of Denver, Colorado. O: B. Thum. il Munic Eng 49:15-17 Jl'15
Location and construction of highways in mountain country. B. W.

description and construction of highways in mountain country. F. W. Harris, il diags Eng N 72:1199-1201 D 17 '14; Excerpt (Don'ts in mountain road location). Eng & Min J 99:237-8 Ja 30 '15; Excerpt (Bagley scraper for road making). Eng & Min J 99:325 F 13

Making a road up the Palisades, il plan Eng N 74:998-1000 N 18 '15 Methods and cost of constructing a mountain road system in Wise county, Virginia. W: F. Cocke. il map Eng & Contr 43:341-4

California road overcomes mountain barrier. N. D. Darlington. il Eng Rec 72:322-3 S 11 '15

oad construction in Denver's mountain parks. O. B. Thum. il plan Munic J 38:417-20 Road

Storm King highway, New York, H. E. Breed, il map Eng N 74:721-4 O 14 '15

Mountaineering Switzerlands in America. A. C. Laut. il Am For 20:839-57 D'14 Mountains

Switzerlands in America, A. C. Laut. il Am For 20:839-57 D '14 See also Mitchell, Mt.

Moving. See Building moving

Moving picture laboratories

Air conditioning in a moving picture laboratory, il plans Heat & Ven 12:20-6 F '15

Moving picture theaters

ritish India; cinematograph theaters. U S Sp Cons Rep 72:167-8 '15

Modern moving picture theatre: Globe theatre, Los Angeles. il plans Bldg Age 37:19-26 Ja

Moving oving picture theater of to-day. il plans Bldg Age 37:19-25 N '15

Planning the moving picture theatre. J. J. Klaber. il plans Arch Rec 38:540-54 N '15 Plumbing installation in movie theater, il plan Metal Work 84:99-100 Jl 23 '15

## Ventilation

Chicago ventilation commission first report. il Metal Work 83:632-5+ Ap 30 '15

Proposed standards for ventilation legislation for motion picture show places; with dis-cussion. Am Soc Heat & V E 19:166-78 '13 entilating southern motion picture theater. il plan Metal Work 83:869-70+ Je 18'15 Ventilating

Moving pictures
Arc-light controller for motion picture projection apparatus. il Sci Am 112:272 Mr 20

Artificial lighting of moving picture studios. W: A. D. Evans. il Illum Engr 8:284-8 Je '15

Compensare for motion-picture projectors. C. Walford, diag Elec R & W Elec'n 67:230-1

Ag 1 15
Electric lighting for motion-picture studios.
L. G. H. Smith. Elec W 65:1040-2 Ap 24 15
Electric sunshine in movie production in California. il Elec W 66:136 Jl 17 15
How motion pictures are made. Mach 21:445
F 15

F '15
Intermittent mechanism for motion picture projectors. W. B. Morton, il diags Sci Am 112:614 Je 19 '15
Invention and development of photography; from the daguerreotype to the moving picture, Sci Am 112:564+ Je 5 '15
Kinematographics. Sci Am S 80:251 O 16 '15
Kinematographics. Sci Am S 80:251 O 16 '15
Methods by which the European war has been filmed. E. A. Dench. Sci Am 112:277+ Mr 20

"15"
Motion picture magic; playing tricks on time. C. H. Claudy. il Sci Am 112:454-5 My 15 '15
Motion picture magic; what we see and what we think we see. C. H. Claudy. il Sci Am S 80:184-5 S 18 '15
Motor-driven motion-picture projector. il Elec R & W Elec'n 67:952 N 20 '15
Non-winding motion-ricture reel. il Elec R & W Elec'n 66:222 Ja 30 '15
Notes on the use of light in cinematograph work. Illum Engr 8:310-14 Jl '15
Producing mechanical moving pictures. Mach 21:455-6 F '15
Romance of motion pictures. C. F. Jenkins.

21:455-6 F '15
Romance of motion pictures. C. F. Jenkins. Sci Am S 79:323 My 22 '15
Stop motion for moving picture machines. W. B. Morton. diags Sci Am S 79:396-7 Je W. B 19 '15

Strangest city in the world; a town given over to the moving pictures. il Sci Am 112: 365 Ap 17 '15 Throw-over arrangement for operating two motion-picture machines. diag Elec R & W Elec'n 67:341 Ag 21 '15

See also Moving picture laboratories; Moving picture theaters

Moving pictures, Colored
Difficulties of color cinematography. J Fr
Inst 180:633 N '15
Motion pictures in colors. E. Coustet. diags
Sci Am S 78:386-7 D 19 '14

Moving pictures, Municipal Advertising a city by moving pictures.

A. Marple. Munic Eng 48:298 My '15

A. Marple, Munic Eng 48:298 My 19

Moving pictures in education
Films may help in the selection of an occupation. Sci Am S 80:333 N 20 '15
Government uses motion pictures. C. J. Blanchard, il Sci Am S 80:120-2 Ag 21 '15

Motion films of molecular movements. il Elec W 66:708 S 25 '15

Moving picture exchange for A. E. R. A.?
F. J. Warnock. Elec Ry J 46:820-1 O 16 '15

Sefety first for you and me. H. L. Brownell. Safety first for you and me. H. L. Brownell. Elec Ry J 45:749 Ap 17 '15

Uncle Sam in the movies. C. J. Blanchard. il Am For 21:532-40 Ap '15

Moving pictures in industry

Circulating motion-picture films to stimulate electrical business. Elec W 65:173 Ja 16 '15

Motion picture in industry utilized by manufacturers of machinery in selling their products. A. L. Morris. il Iron Tr R 56:517-18 Mr 11 '15

Moving pictures in science otion pictures of electrolysis, il Sci Am S 80:340-1 N 27 '15

Röntgen motion pictures; the Dessauer process. il Sci Am 112:312 Ap 3 '15

Moving pictures in war Military air scouting by motion pictures. E. A. Dench. Sci Am 112:156 F 13 '15

Moving stairways Extension of the Bakerloo tube, il plan Engineer 119:92 Ja 22 '15

Mufflers, Automobile. See Automobile mufflers

Muir, John, 1838-1914
Appreciation. G: B. Sudworth, por Am For 21:184-5 Mr '15
John Muir in college, C: E. Vroman. Sci Am S 80:103 Ag 14 '15

Mules

Mine mule investigations. G. E. Wentworth. Colliery 35:261-2 D '14

Multiplication

Multiplying large numbers on adding ma chines, R. C. Hardman, Eng N 74:703 O 7 '1

Mundy, Joseph S., 1847-1915 Sketch, por Eng N 73:1141 Je 10 '15

Municipal accounting

Unicipal accounting
Classifications of municipal expenditures in budgets and accounts and the purposes which they subserve. L. G. Powers. J Account 19:118-36 F '15
Development of a unit cost system. N. Cunliff. il Assn Eng Soc J 53:74-85 Ag '14; Same. Eng & Contr 42:374-6 O 21 '14; Discussion. Assn Eng Soc J 53:85-101, 165-70
Ag-S '14
Inaccurate municipal converted.

Ag-S 14 Inaccurate municipal accounting and cost keeping. Eng & Contr 43:438 My 19 '15 Municipal accounting and its relationship to government. H. W. Carroll. J Account 20: government. 260-70 O'15

See also Municipal finance

## Bibliography

List of references on municipal accounting. H. H. B. Meyer. Special Libraries 6:63-77 Ap '15

Municipal advertising
Advertising a city by moving pictures.
A. Marple. Munic Eng 48:28 My '15
Municipal art. See City planning; Municipal

buildings

Municipal buildings

lunicipal buildings
Annex to the city hall, Boston, Mass. il plans
Arch & Bldg 47:265-7 Jl '15
Bridges and buildings in cities, 1915; tabulation. Munic Eng 48:267-8 Ap '15
City hall, Burlingame, California; views and
plans. Brickb 23:pl 182-3 D '14
City of Jacksonville engineering building.

City of Jacksonville engineering bullens. W. P. Darwin, il plans Eng N 72:1220 D 17

Municipal public halls; court decisions in several states. J: Simpson, Munic J 39:617-19 O 21 '15

Project for large municipal convention hall in Chicago. il map Ry R 56:100-1 Ja 16 '15 San Diego's municipal stadium, F. A. Rhodes, il plan Eng N 74:577-80 S 23 '15

See also Public comfort stations

Municipal centers. See City planning

Municipal charters
Proposed new charter for Newark, N. J.
Munic Eng 49:140 O '15

Municipal colleges Training for the municipal service. C. L. King. Sci Am S 79:118-19 F 20 '15; Same cond. with discussion, Am Soc M E J 37:98-101 F '15

Municipal corporations
Municipal powers re. lighting plants. J. Simpson. Munic J 33:880-3 Je 24 '15
Municipal trading; legal powers of cities to engage in plumbing, brick manufacture, quarrying and dealing in fuel, real estate and liquor. J. Simpson. Munic J 38:732-4 My 27 '15; Same abr. Munic Eng 49:24-5 JI '15

Municipal electric shops. See Electric shops, Municipal

Municipal electricians, International association of. See International association of municipal electricians

Municipal employees

Training for the municipal service. C. L. King. Scf Am S 79:118-19 F 20 '15; Same cond. with discussion. Am Soc M E J 37: 98-101 F '15

Municipal engineering
Application of geology to the problems of the
numicipal engineer, II. Lapworth. Eng &
Contr 42:179-81 Ag 19 '14

roader applications of chemistry by the municipality. H. W. Mahr. J Ind & Eng Broader

City engineer's records in Frankfort, Ind. R. H. Boynton. Munic Eng 49:78-9 Ag '15; Same. Eng & Contr 44:165-6 S 1 '15

Employment of experts by cities. M. L. Cooke. Eng & Contr 42:398 O 28 '14 Factors in municipal engineering. M. L. Cooke. Sci Am S 80:238-40 O 9 '15; Abstracts. Am Soc M E J 37:31-7 F '15; Eng Rec 70:644-5 D 12 '14; Eng & Contr 42:575-6 D 23 '14; Discussion. Am Soc M E J 37:85-7 F '15

Municipal engineering works of San Francisco.
A. J. Cleary, il plans maps diags Eng N 73:
289-325 F 18 15

Principles governing the organization of city engineering departments. E: Willis. Eng & Contr 42:253-5 S 9 '14 Rules for subordinate engineers on municipal work. M. M. O'Shaughnessy. Eng N 73:446 Mr 4 '15

Sidewalk work in Cincinnati; securing the construction of sidewalks, assessing for and keeping records of same. D. L. Barr. Munic J 38:763-6 Je 3 '15

Standardizing engineering positions and salaries in New York city. Eng N 73:54-5 Ja 14

See also Municipal improvement; Parks; Pavements; Public works; Refuse and refuse disposal; Refuse collection; Sanitary engineering; Sewage disposal; Sewerage; Street cleaning; Streets; Water purification; Water supply engineering

Municipal exhibits

Municipal exhibit at Dayton, Ohio. il Munic J
39:690-2 N 4 '15

Municipal farms
Water-works farming and forestry by Los
Angeles. B. A. Heinly. Eng N 73:745 Ap 15
'15

Municipal finance

unicipal finance Annual budget. W: T. Childs, Munic J 39: 515-7 O 7 15 Financing public improvements on the pay-as-you-go plan. C: B. Buerger. Eng N 72: 1179-80 D 10 '14 How apportion costs of municipal improve-ments? N. P. Lewis. Eng Rec 72:666-7 N 27 '15.

Making water bills a lien on real property. Eng & Contr 42:425-6 N 4 '14

Municipal expenditures. Munic J 38:11 Ja 7 '15 Paying contractors in bonds. A. F. Bell. Munic J 39:809-10 N 25 '15

Payment for special street lighting. Elec R & W Elec'n 65:1129-30 D 12 '14

Rational budget making. Munic J 39:695-7 N

See also Municipal accounting; Municipal government

Municipal forests. See Forests, Municipal

Municipal franchises

eatures of nineteen typical heating fran-chises. il Heat & Ven 12:43-5 Jl '15

Modern franchise for a public service corporation. C: C. Brown. Munic Eng 48:89-93 F '15

Municipal co-operation in public utility management, P. J. Kealy, Am Inst E E Pro 34: 2263-74 O '15; Same cond. Elec Ry J 46:861-3 O 23 '15

Public service corporation and the municipality; with discussion. J. Logan. Boston Soc C E J 2:223-59 Je '15

Nee also Electric service companie Franchises; Street railroads—Franchises companies-

Municipal garages. See Garages, Municipal Municipal gas plants. See Gas manufacture and works, Municipal

Municipal government

Aspects of city-planning administration in Europe. F. B. Williams. Am Inst Arch J 3: 260-4 Je '15

Municipal life and government in Germany, by W: H. Dawson. Review. Munic Eng 48: 142-3 F '15

Organization, character of personnel, scope of work, and methods of operation and con-trol of a large municipal highway depart-ment. W: H. Connell. il map J Fr Inst 179: 439-69 Ap '15

Municipal government -- Continued

Principles governing the organization of city engineering departments. E: Willis. Eng & Contr 42:253-5 S 9 '14

See also Fire departments; Municipal corporations; Municipal finance; Municipal law; Municipal officers; Municipal ownership; Municipal supplies; Police

City manager plan

City manager plan

City managers in the West. W. F. Kerr. Munic Eng 48:1392-291 Mr '15.

Commission and city manager forms of government. H. H. Rumble, R. W. Peatross and J: E. Burke. Munic Eng 49:52-6 Ag '15.

Commission government and an engineer manager for Lakeland, Florida. H. D. Mendenhall. Munic Eng 48:249-51 Ap '15.

Commission-manager form of government. D. A. Reed. Eng & Contr 48:92 F 3 '15.

Commission-manager form of government and its relation to the engineering profession. H: M. Waite. Boston Soc C E J 2:11-14 Ja '15; Abstract. Eng M 48:894-6 Mr '15; Discussion. Boston Soc C E J 2:14-21 Ja '15.

Commission-manager government. Munic J 38:318 Mr 11 '15

38:318 Mr 11 '15
 Dayton's progress under commission-manager,
 W: S. Crandall, Munic Eng 49:67 Ag '15
 Discussion of the commission-manager form of government, J: B. Blood, Boston Soc C E
 J. 2:121-3 Mr '15

J 2:121-3 Mr '15
Early difficulties encountered under the commission-manager form of municipal government. Eng & Contr 42:551 D 16 '14
Experience at Inglewood, Calif., with the city manager form of government. P. E. Kressley. Eng & Contr 42:465-6 N 11 '14
First convention of city managers. Eng N 72: 1189-90 D 10 '14
Hour with a city manager. Eng Rec 71:169 F 6 '15

6 '15
Powers and duties of the city manager defined, H. M. Waite. Eng Rec 72:664 N 27 '15
Publicity necessary for city manager success.
W. Miller. Eng Rec 72:666 N 27 '15
Results obtained at Abilene, Kan., in 16
months under commission-manager government. K. Riddle. Eng & Contr 42:503-4 N
25 '14

Training of the city manager. H. M. Waite. Munic Eng 48:44 Ja '15 Year of commission-manager government at Lakeland, Fla. D. F. McLeod. Eng N 72:1118

Titusville, Penn. L. O. Bradley. Eng N 72: 1155 D 10 '14

Commission plan

Commission and city-manager cities. Munic J 38:686 My 20 '15 Commission and city manager forms of gov-ernment. H. H. Rumble, R. W. Peatross and J: E Burke. Munic Eng 49:52-6 Ag '15

Municipal halls. See Municipal buildings Municipal improvement

rchitect's part in the world's work. F: L. Ackerman. Arch Rec 37:149-58 F '15

British India; improvement trusts. il U S Sp Cons Rep 72:61-6 '15

How apportion costs of municipal improvements? N. P. Lewis. Eng Rec 72:666-7 N '15

Municipal improvements for 1915; tabulation. Munic Eng 48:252-71 Ap '15

Pertinent paragraphs from a real M. L. Cooke, il Eng M 50:445-9 D '15

See also Baths, Public: Building laws; City planning; Cleaning of cities; Dust prevention; Electric wire and wiring; Fire protection; Garden cities: Harbors; Housing problem; Landscape gardening; Lighting; Parks; Pavements; Public comfort stations; Refuse and refuse disposal; Refuse collection; Smoke prevention; Streets; Trees

Municipal improvements, American society of. See American society of municipal improvements

Municipal laboratories Portland's municip

land's municipal testing laboratory. White, il Munic J 39:808-9 N 25 '15

Municipal law

Unicipal taw Contracts by municipal officers. J: Simpson. Munic J 39:807-8 N 25 '15 Municipal public halls; court decisions in several states, J: Simpson, Munic J 39: 617-19 O 21 '15

Use of patented articles: court decisions in the several states as to conditions under which cities may contract for patented pavements and other articles. J. Simpson. Munic J 38:13-15 Ja 7 '15

\*\*Rice also Building laws; Fire protection—Laws; Plumbing laws and regulations; Public health laws; Roller skating—Regulation; Sewerage—Laws; Street openings; Street traffic; Trees; Waterworks—Law

Municipal lighting plants. See Electric plants, Municipal

Municipal markets. See Markets, Municipal

Municipal motor trucks. See Motor trucks.

Municipal officers

unicipal officers
Contracts by municipal officers. J: Simpson.
Munic J 39:807-8 N 25 '15
Experience of an engineer in public office.
M. L. Cooke. Am Soc M E J 37:708-9 D '15
Training for the municipal service. C. L. King.
Sci Am S 79:118-19 F 20 '15; Same cond.
with discussion. Am Soc M E J 37:98-101 F

Municipal ownership
Detroit mannerpal ownership proposal, Elec
Ry J 45(43) F 27 15
Disadvantages, B. J. Arnold, Elec Ry J 46:
911 O 30 15

Disadvantages. B. J. Arnold. Elec Ry J 46: 911 O 30 '15
Municipal fertilizer plant at Los Angeles.
B. A. Heinly. Eng N 73:1063-4 Je 3 '15
Municipal ownership and operation of waterworks: case for state control. M. N. Baker,
Eng N 72:1115 D 3 '14
Municipal ownership growth. Munic Eng 49:79

Ag '15
Municipal trading; legal powers of cities to
engage in plumbing, brick manufacture,
quarrying and dealing in fuel, real estate
and liquor. J. Simpson. Munic J 38:732-4 My
27 '15; Same abr. Munic Eng 49:24-5 J1 '15
Philadelphia conference: criticism. H. G. D.
Nutting. Elec R & W Elec'n 65:1145 D 12 '14

State control of city-owned utilities much needed. Eng N 74:658-9 S 30 '15

State regulation of municipally owned plants. C. M. Larson, Am Water Works Assn J 2: 515-37 S '15

See also Asphalt plants, Municipal; Cement plants, Municipal; Electric plants, Municipal; Gas manufacture and works, Municipal; Government ownership; Government regulation of industry; Hydroelectric plants, Municipal; Markets, Municipal; Movernment; Public service corporations—Regulation; Repair shops, Municipal; Street railroads, Municipal roads, Municipal

Municipal plants. See Asphalt plants. Municipal; Electric plants, Municipal; Hydroelectric plants, Municipal

Municipal records
Portland, Ore., bureau of photography. H. M.
White. il Munic J 39:577-8 O 14 '15

Record system in a smoke inspector's office, M. A. Rooney. Power 42:543-4 O 19 '15

Signal box records. P. I. Patton. Munic J 39: 397-8 S 9 '15

Municipal repair shops. See Repair shops, Municipal

Municipal sanatoriums. See Sanatoriums, Municipal

Municipal supplies

Broader applications of chemistry by the municipality. H. W. Mahr. J Ind & Eng Chem 6:1030-2 D'14

Portland's municipal testing labors H. White. il Munic J 39:808-9 N 25 '15 laboratory.

Purchasing and distributing supplies in Cleveland. A. R. Callow. il Munic J 39:391-4 S 9

Municipal trading. See Municipal ownership Munitions of war. See War materials

Mural painting and decoration Mural painting in America, by E. H. Blash-field. Review by R: F. Bach. Arch Rec 37: Ja '15

Villa Madama; text and measured drawings by Howard W. Germann, il Arch Rec 37:26-47

See also Stucco

Muscatine, Iowa
City founded on sawdust; how part of Muscatine came to be built on such a foundation.
diag map Eng Rec 71:496-7 Ap 17 '15

Museums

laking museums useful. H. I. Smith. diags Sci Am S 79:348-9 My 29 '15 Sce also Anthropology—Exhibitions; also Field museum of natural history Making

Lighting

Glare in museum galleries; the psychological factor in the lighting problem. B: I. Gilman, diags Arch Rec 38:262-80, 362-78 Ag-S '15

Museums, Art. See Art galleries

Museums, Children's. See Children's museums

Mushrooms

Mushroom Lorelei and its dangers. R. M. F. Berry. Sci Am S 80:263 O 23 '15 Raising mushrooms in a coal mine. S. C. Rey-nolds. il Colliery 36:103 S '15

Developments of the audion lamp—music from light. Elec R & W Elec'n 67:908-9 N 13 '15

See also Color music; Musical instruments

Musical instruments Musical woods. Sci Am.S 78:355 D 5 '14

Mechanical devices

Device for the simultaneous playing of violin and piano, il Sci Am 113:471 N 27 '15

Musical pitch

Musical pitch to the eleventh decimal. J: B. Taylor. Sci Am 112:289 Mr 27 '15 Optophone and musical pitch. E. H. Hawley. Sci Am 111:523 D 26 '14

Musk

Loss of weight of musk in a current of dry air, C: B. Bazzoni, diag J Fr Inst 180:463-9 O'15

Mussels

Our neglected aquatic foods. Sci Am 112:332 Ap 3

Mustard seed
Production, botanical composition and volatile
oil strength of American wild mustard seed.
A. L. Winton and J. H. Bornmann, J Ind &
Eng Chem 7:684-6 Ag '15

Myrica rubra

Coloring principle of myrica rubra—its azo-, sulfide- and nitro-dyestuffs. S. Satow. J Ind & Eng Chem 7:113-15 F '15

Nails

Electromagnetic nail packing machine. il Iron Age 95:900-1 Ap 22 '15 Holding power of nails; abstract. Am Soc M E J 37:719-21 0 17

E J 37:719-2 (1-15)
Internally fired nail bluing furnace, il Iron
Age 95:1295 Je 10 '15
New machine for making wire nails, il diag
Iron Age 95:792-3 Ap 8 '15

Nameplates Making sectional molds for die-cast name-plates, E: K. Hammond, il Mach 21:554-7 Mr '15

Names

Orthography in geography and biography. F. H. Teall. Inland Ptr 54:485-7 Ja '15

Names, Geographical

Problem in war names; Kiessaw, Sci Am 111;486 D 12'14

Naphthalene

oal gas residuals—Feld process. F. H. Wag-ner. Am Gas Inst Pro 9:pt 1, 340-61 '14;

Same cond. Am Gas Light J 101:306-7 N 16
'14; Same cond. Met & Chem Eng 12:698-9
N '14; Same cond. Sci Am S 80:317-18 N 13
'15; Discussion. Am Gas Inst Pro 9:pt 1,
361-7 '14

Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid, and naphthalene. H. C. Dickinson, bibliog U S Bur Stand Bul 11:189-257 Mr 1 '15

Narcotics

How narcotics affect plants. Sci Am S 79: 267 Ap 24 '15 Nashville, Tennessee

Water supply

Repairing and waterproofing the Nashville water-works reservoir, W. W. Southgate, il diags Eng N 73:849-52 My 6 '15

Nashville, Chattanooga & St. Louis railway Chattanooga creek bridge. C. H. Johnson. il plan Ry Age 59:343-5 Ag 20 '15

Natalite

Natalite a gasoline substitute. Automobile 32: 1094 Je 17 '15

National academy of sciences
National academy of sciences and the national
government. Sci Am 113:176 Ag 28 '15
Needs of the National academy of sciences.
Sci Am 113:136 Ag 14 '15
Why we need a National academy of sciences.
Sci Am 113:154 Ag 21 '15
National academy of sciences.

National association of builders exchanges Convention, Columbus, O., Jan. 26-28. Age 37:33-7 Mr '15

National association of corporation schools
Annual convention at Worcester, Mass. Iron
Age 95:1375 Je 17 '15

National association of cotton manufacturers
Annual meeting in Boston. Textile World 49: 99th meeting; papers. il Textile World 49:607-39 S '15

National association of electrical inspectors Convention, New York city, March 23. Elec W 65:824 Mr 27 '15 Convention, New York city, March 23-25. Elec R & W Elec'n 66:601 Mr 27 '15

National association of hosiery and underwear

manufacturers 11th annual meeting, Philadelphia, May 3-8. Textile World 49:233-44+ My '15

National association of manufacturers 20th annual convention, New York, May 25-26. Iron Age 95:1226-7 Je 3 '15

National association of manufacturers of elec-

lectrical manufacturers make progress organization plans. Elec R & W Elec'n 232 F 6 '15 Electrical

National association of master plumbers
Annual convention, Chicago, July 13-15. Heat
& Ven 12:46-7 Ag '15
33d annual convention, Chicago, July 13-15.
Metal Work 84:121-9 J1 23 '15
33d annual convention; with account of Des
Moines and Salt Lake City indictments, list
of delegates, etc. Dom Eng 72:59-79 J1 17
'15

National association of master steam and hot water fitters

water fitters

Annual convention, Milwaukee, June 21-24, Metal Work 84:24-8 JI 2 '15

27th annual convention, Milwaukee, June 21-24, Dom Eng 71:372-5 Je 26 '15

27th annual convention, Milwaukee, June 21-24, 1915. Heat & Ven 12:35-40 JI '15

National association of railway commissioners

Annual meeting, San Francisco, Oct. 12-16. Ry

Age 59:739 O 22 '15

27th annual convention. Con Technology

27th annual convention, San Francisco, Oct. 12-16. Elec W 66:961 O 30 '15

National association of scale experts 11th semi-annual meeting at Chicago, Ill. Ry Age 58:269-70 F 12 '15

National association of sheet metal contractors 11th annual convention, Denver, June 7-11. Metal Work 83:890-8 Je 18 '15

Trade development committee meeting, Chi-cago, Nov. 12. Metal Work 84:660-1 N 19 '15

National association of stationary engineers 33d annual convention, Columbus, O., Sept. 13-18. Power 42:462-3 S 28 '15

National association of stove manufacturers Convention, New York city, May 12-13. Metal Work 83:746 My 21 '15

National association of wool growers 51st annual meeting at Salt Lake City, 12-14, 1914. Textile World 48:283-6 D'14

National association of woolen and worsted overseers

List of members present at 32d annual meeting. Textile World 48:362-3 D '14 33d semi annual meeting, Rocky Point, R. I., May 15. Textile World 49:391-2 Je '15

National automobile chamber of commerce Chamber of commerce to defend Kardo patents suit. Horseless Age 34:829-30 D 9 '14

National cash register company
Modern plating practice: a piecework system
as used by the National cash register company, W. Fraine, il Metal Ind n s 13:1-4 Ja

Research work at the National cash register company. H. G. Dorsey. il Sibley J 29:115-21 Ja '15

National characteristics Random reflections. Sci Am 112:326+ Ap 3

National civic federation
15th annual meeting. Elec R & W Elec'n 65:
1142 D 12 '14
Governmental versus private enterprise discussed. Elec W 64:1140-1 D 12 '14

National commercial gas association

Minneapolis convention. Am Gas Light J 101: 360-1, 377 D 7-14 '14

National conference on city planning Seventh conference in Detroit, June 7-9. Eng N 73:1190 Je 17 '15

National district heating association
7th annual convention, Chicago, June 1-3. Dom
Eng 71:285-7 Je 5 '15; Elec R & W Elec'n
66:1117-20 Je 12 '15; Elec W 66:1576-7 Je 12
'15; Heat & Ven 12:37-45 Je '15; Metal Work
83:853-5 Je 11 '15; Power 41:861-3 Je 22 '15

National electric light association Commercial section plans. Elec W 66:446-7 Ag

28 '15
Constructive work before the N. E. L. A. H. H. Scott. Elec W 65:5-6 Ja 2 '15
Convention, San Francisco, June 8-11. Elec Ry J 45:1106-9 Je 12 '15
Future work of N. E. L. A. E. W. Lloyd. Elec W 66:155-6 Jl 17 '15
Meetings of N. E. L. A. executive committee. Elec W 66:186-7, 695-6; 66:906 Ja 16, Mr 13, 0 '23 '15

E. L. A. rules to harmonize service requirements for motors. Elec W 66:93 Jl 10

38th annual convention, San Francisco, June 7-11; abstracts of papers and reports. Power 41:858-60 Je 22 '15 38th convention; abstracts of papers and reports. Elec R & W Elec'n 66:1107-13 Je 12

38th convention, San Francisco: abstracts of papers and discussions. Elec W 65:1502-34 Je 12 '15 Je 12

th convention, San Francisco, June 8-11. Elec R & W Elec'n 66:1095-1104 Je 12 '15 38th

National electric light association, lowa section 15th annual convention, Keokuk, April 20-22. Elec R & W Elec'n 66:816-20 My 1 '15

National electric light association, Michigan section

W Elec'n 67:27-30 Jl 3 '15

th annual convention, June 26-30. Elec R & th annual convention, June 26-30. Elec W 66:108-9 Jl 10 '15

National electric light association, New Eng-

land section

New England question box convention. Elec
R & W Elec'n 66:537-40, 598-600 Mr 20-27

New England section 7th annual convention. Elec R & W Elec'n 67:577-83 S 25 '15 New England section 7th annual convention, Kineo, Me., Sept. 14-17. Elec W 66:680-1 S 25 '15

National electric light association. Southeastern

outneastern section annual convention, Asheville, N. C., Sept. 22-24. Elec W 66:736-7 O 2 '15 Southeastern

National electrical code
Changes in National electrical code. Elec W
65:878-80 Ap 3 '15
National electrical code amended at conference in New York city. Elec R & W Elec'n
66:624-8 Ap 3 '15

66:624-8 Ap 3 '15
National electrical code wiring rules compared with the German and English rules. Elec R & W Elec'n 65:1081-9 D 5 '14
Proposed changes in the code to be considered by electrical committee. Elec R & W Elec'n 66:337-40 F 20 '15
Questions and answers on the National electrical code. See weekly numbers of Electrical review and western electrician
Revising the code. Elec R & W Elec'n 66:613-14 Ap 3 '15
See also Electric inspection

See also Electric inspection

National electrical contractors' association Convention at San Francisco, Elec W 66:215-16 Jl 24 '15 15th annual convention, San Francisco, July 21-24. Elec R & W Elec'n 67:202-4 Jl 31 '15

National electrical safety code Conference on safety code, Elec W 66:956-7 O

30 15
Criticism. C. L. S. Tingley. Elec Ry J 45:845
My 1 '15
Defense of the Safety code. E. B. Rosa. Elec
Ry J 45:939-41 My 15 '15
Electrical safety rules issued. S. W. Stratton.
Elec W 65:9102-5 My 1 '15
National electrical safety rules. E: B. Rosa.
Elec W 65:915-17 Ap 10 '15; Same. Elec Ry J
45:1730-1 Ap 17 '15
Opinions. C. L. Cadle; J. H. Hanna. Elec Ry
J 45:1036 My 29 '15
Proposed National electrical safety code. U S
Bur Stand Circ 54:1-137 '15
Proposed rules formulated by the Bureau of
standards. E. B. Rosa. Elec W 65:845-7 Ap
3 '15

Safety rules to be observed in the Safety rules to be observed in the operation and maintenance of electrical equipment and lines. U S Bur Stand Circ 49:1-50 '14; Abstract. Elec R & W Elec'n 65:418-19 Ag 29 '14; Abstract. J Fr Inst 178:350-4 S '14; Abstract. Power 40:806-7 D 8 '14 Wisconsin considers safety rules. Elec W 66: 959-60 O 30 '15

National exposition of chemical industries First exposition at the Grand Central palace, New York city, Sept. 20-25. Textile World 50:67-9 O '15

50:67-9 O '15

First exposition at the new Grand Central palace, New York city, Sept. 20-25. J Ind & Eng Chem 7:896-8 O '15

First National exposition at the Grand Central Palace, New York, Sept. 20. Eng & Min J 100:441 S 11 '15

Program and list of exhibitors. Met & Chem Eng 13:574 S 1 '15

Summary of exhibits and lists of papers read at first exposition. Il Met & Chem Eng 13: 690-700 O 1 '15

Technical society meetings and lectures Met

Technical society meetings and lectures. Met & Chem Eng 13:629 S 15 '15

National fire protection association 19th annual convention, New York, May 11-13. Elec W 65:1264-5 My 15 '15

19th annual convention, New York, May 11-13. Eng Rec 71:667 My 22 '15

National foreign trade convention, 2d Export xport movement set forward at St. Louis. Iron Age 95:246-51+ Ja 28 '15

Meeting at St. Louis, Jan. 21 and 22, 1915. Elec W 65:253-4 Ja 23 '15

National forests. See Forest reserves

National founders' association 19th annual convention, New York, Nov. 17-18. Iron Age 96:1242-7 N 25 '15

19th annual convention, New York, Nov 17-18. Iron Tr R 57:1000-1, 1043-6 N 18-25 '15

National garage association Growth of the National garage Horseless Age 35:634-5 My 12 garage a association. National guard (United States). See United States—Militia

National hardware association

Manufacturers and distributors of tin plate and sheet metal discuss business conditions. Metal Work 83:784-5 My 28 '15

National independent telephone association 18th annual convention, Chicago, February 3 to 5. Elec R & W Elec'n 66:305-8 F 13 '15

National industrial traffic league Annual meeting, Chicago, Nov. 17-18. Ry Age 59:1004 N 26 15

National machine tool builders' association ational machine tool builders' association
13th semi-annual convention, Atlantic City,
May 20-21, Iron Age 95:1173-8 My 27 '15
14th annual convention, New York, Oct. 28-29,
Iron Age 96:1060-3+ N 4 '15
14th annual convention, New York, Oct. 2829, Iron Tr R 57:906-8 N 4 '15
Spring convention, Atlantic City, May 20-21,
Iron Tr R 56:1074-5 My 27 '15

National metal trades association
Annual meeting in New York, April 14-15.
Iron Age 95:890-3 Ap 22 '15
I7th annual convention, New York, April 1415. Mach 21:769 My '15

Steady progress in co-operation as indicated by reports at the annual convention of the National metal trades association. Iron Tr R 56:825-30 Ap 22 '15

National municipal league 20th annual convention, Baltimore, Nov. 18-20, 1914. Munic J 37:812 D 3'14

National parks

Canada

Parks in the Canadian Cordillera. J: A. Allan. il Sci Am S 80:360-2 D 4 '15

United States

United States will capitalize its scenery, il Eng Rec 72:568-70 N 6 '15

See also Forest reserves; Rocky mountain national park; Yellowstone national park

National pipe and supplies association nnual convention, with list of those in attendance. Dom Eng 71:229-31 My 22 '15

National plumbing code, Need of. F. J. Hanley. Dom Eng 72:176-8 Ag 7 '15

National rivers and harbors congress
11th annual convention, Washington, Dec. 911, 1914. Eng Rec 70:sup295-6 D 19 '14

National road. See Cumberland road

National safety council
Annual congress; railroad section. Ry Age 59:
813-16 O 29 '15
Convention at Philadelphia, Oct. 19-21. Iron
Age 96:982-3 O 28 '15
4th annual congress, Philadelphia, Oct. 19-21.
Elec R & W Elec'n 67:804-5 O 30 '15
Fourth congress, Philadelphia, Oct. 19-21.
Elec Ry J 46:905 O 30 '15

National scrap iron and steel association crap dealers: perfect national organization. Iron Tr R 56:231 Ja 28'15

National security league Naval and military exhibit of the National security league. il Sci Am 112:626 Je 26 '15

National silk convention

First national silk convention, Paterson,
N. J., Oct. 12-14. Textile World 50:191-6

National supply and machinery dealers' association

Meeting, New York, Oct. 28. Iron Tr R 57: 908-9 N 4 '15

National tube company Panama-Pacific exposition. il Power 42:586-8 O 26 '15

warm air heating and ventilating National

association Annual meeting, Detroit, Mich., June 9. Metal Work 83:899-901 Je 18 '15

Discussion on warm air heating. Metal Work 83:335-6 F 26 '15

Regulating warm air furnace practice: tentative recommendations for a standard of procedure. Metal Work 83:646-8 Ap 30 '15

Natural gas. See Gas, Natural

Natural history museums. See American museum of natural history; Field museum of natural history

Natural resources

See also Forests and forestry; Mineral lands; Mines and mineral resources; Water

Natural steam. See Steam, Natural

Naval advisory board. See United States—Naval consulting board

Naval architects and marine engineers, Society See Society of naval architects and marine engineers

Naval architecture

Cable-repairing steamer "Transmitter." F. C. Coleman, il plan Int Marine Eng 20:382-6 S

Calculations for ships' forms; light thrown by Calculations for ships' forms; light thrown by model experiments upon resistance, propulsion and rolling of ships. D. W. Taylor. Int Marine Eng 20:443-5 O '15 (to be cont) Emergency exit from boiler rooms. il Sci Am 113:201+ S 4 '15 Expansion or contraction of dimensions and the effect upon resistance. H. C. Sadler. diags Int Marine Eng 20:11-14 Ja '15 Experiments with models having radical variations of after sections. D. W. Taylor. Int Marine Eng 20:14-16 Ja '15 Fire-room emergency escape, diags Int Marine

Fire-room emergency escape. diags Int Marine Eng 20:410-12 S '15 Institution of naval architects; spring meet-ing. Engineer 119:299-201, 334-7 Mr 26-Ap 2

Japanese liner Fushimi Maru, il plan Int Marine Eng 20:311-12 Jl '15 Rules for freeboard. Engineer 119:333-4 Ap 2

Southern Pacific ferry steamer Alameda. E: W. Olin. il plans Int Marine Eng 20:194-8 My '15

Steamer Emblane. il plans Int Marine Eng 20:

Steamer Emblane, il plans Int Marine Eng 20: 297-8 JI '15
Steamship design; a method of determining the principal dimensions. H. A. Everett. Int Marine Eng 20:436-40 O '15
S. S. Great Northern and Northern Pacific for the Spokane, Portland & Seattle railway company, il diags plans Int Marine Eng 19: 535-45 D '14
Turbine passenger steamships Great North-

Turbine passenger steamships Great Northern and Northern Pacific. il plan (supp) Engineer 120:129-31 Ag 6 '15
Typical ships. il diags plan (supp) Engineer 117:366-70: 118:229-32, 359-62, 573-5 Ap 3, S 4, O 16, D 18 '14
Western river steamers and barges. E. A. Burnside. il plan Int Marine Eng 20:478-87 N '15

Sce also Car ferries; Coaling vessels; Ferryboats; Freight ships; Hydroplanes; Launching: Light ships; Motor barges; Motor ships; Propellers; Revenue cutters; Schoolships; Ship resistance; Shipbuilding; Ships; Snag boats; Steamboats; Submarine boats; Tank ships; Torpedo boat destroyers; Towboats; Warships

#### Deckhouses

Scantlings on light superstructures; with discussion. J. Montgomerie. Engineer 119:334-5 Ap 2 '15

#### Subdivisions

Application of subdivision rules adopted at In-

Application of subdivision rules adopted at International conference: abstract. J. Donald. Int Marine Eng 20:9 Ja '15
Report of the departmental committee on bulkheads. Engineer 119:37-8 Ja 8 '15
Water-tight subdivision of ships. J. J. Welch, Engineer 119:318-19; Discussion. 119:300 Mr 26 '15

## Naval art and science

See also Coaling at sea; Mines, Submarine; Range finders; Submarine boats; Target practice; Torpedees; United States—Navy; Warships; also European war—Naval opera-

Naval artillery. See Naval guns

Naval battles

Action in which the Carmania sank the Cap Trafalgar, il Sci Am 111:449 D 5 '14 Battle of the North sea, il Sci Am 112:136-7 F, 6 '15

F 6 '15 Fight between the Constitution and the Guer-rière, il Sci Am 113:14-15 Jl 3 '15 Wrecking of the cruiser Emden by shell fire, il Sci Am 113:376 O 30 '15

Naval consulting board. See United States-Naval consulting board

Naval education

More military and naval academies. R. S. Spear. Sci Am 113:9 Jl 3 '15

Naval engineering. See Marine engineering

Naval gunnery. See Gunnery

Naval guns

Javal guns
Fifteen-inch versus fourteen-inch naval guns,
S. L. Sayre. Sci Am 113:181 Ag 28 '15
Hitting an invisible ship at a ten-mile range.
il Sci Am 112:218-19 Mr 6 '15
Manufacture of English 12-inch guns, C. F.
Jeansen, il Sci Am 113:491 D 4 '15
Sponson mounting for guns, T. W. Brown,
Sci Am 113:487 D 4 '15
Weight of metal versus volume of fire. Sci
Am 112:172 F 20 '15
Which is the most powerful battleship? J. B.
Walker, il diags Sci Am 113:80-1 Jl 24 '15

Naval invention boards. See Great Britain— Admiralty inventions board; United States— Naval consulting board

Naval reserve. See United States-Navy

Contributions of the chemist to the naval stores industry. J: E. Teeple. J Ind & Eng Chem 7:931-2 N '15 Naval stores industry. A. W. Schorger and H. S. Betts. diags 11 pls maps U S Agric Bul 229:1-58 '15

Navies

Auxiliary naval vessels; classification of naval vessels—description of the destroyer tender Melville, il Int Marine Eng 20:295-7 Jl '15 Revolutionizing naval construction. Sci Am 113:286 O 2 '15 Rival navies. Engineer 119:16-17 Ja 1 '15

See also Hospital ships; Naval yards and naval stations; Submarine boats; Warships; also names of countries, subhead Navy, e. g. United States—Navy

Navigation

Electric shriek to warn mariners: Blériot air siren. il Sci Am I12:200 F 27 '15 Suction between passing ships. S. A. Reeve. diags Sci Am S 79:30-2, 46-8, 62-4 Ja 9-23 '15

See also Aeronautics; Buoys; Collisions at sea; Commerce; Fog signals; Lifeboats; Lighthouses; Safety at sea; Ship resistance; Shipping; Ships; Shippwrecks; Sounding; Submarine boats; Submarine signals; Yachts Navy advisory board. See United States—Naval consulting board

Navy yards and naval stations

Concrete pile and cylinder foundations at Charleston. il diag Eng N 74:926-9 N 11 '15 Giant German and Austrian cranes. F. C. Perkins. il Sci Am S 80:145, 148 S 4 '15 Kiel; its naval and engineering features. A. W. Metcalfe. diags Engineer 120:50-2 J 16 '15; Same cond. Sci Am S 80:234 O 9 '15 Shipbuilding in navy yards, Int Marine Eng 20:224-5 My '15

Torpedo-boat berth at the Charleston navy yard. il plan Eng N 74:872-3 N 4 '15

Neatness

Value of neatness, il Ry Age 58:467-8 Mr 12

Negotiable instruments

Negotiable paper. S. Walton, J Account 20: 58-61 Jl '15

Use of trade acceptances in business, E. F. DuBrul, Am Ind 16:25-7 N '15

See also Bills and notes; Checks; Commercial law

Comparisons of lengths of light waves by interference methods, and some wave

lengths in the spectrum of neon gas. W. F. Meggers. U S Bur Stand Bul 12:198-205 N

Neon light tubes. J. Boyer. il Sci Am S 78: 410 D 26 '14 Notes on the noble gases. W. S. Andrews. Gen Elec R 18:408 My '15

Nepal

Country inaccessible to Europeans. Elwes. il Sci Am S 79:357-9 Je 5 '15 H: J:

Edwes. Il Sci Am S 79:357-9 Je 5 '15

Nephelometry (photometric analysis)

History of method and development of instruments. P. A. Kober and S. S. Graves. diags

J Ind & Eng Chem 7:843-7 O '15

Nephelometric estimation of phosphorus.

P. A. Kober and G. Egerer. Am Chem Soc

J 37:2373-81 O '15

Nephelometric estimation of purine bases,
including uric acid, in urine and blood. S. S.
Graves and P. A. Kober. Am Chem Soc J

37:2430-47 O '15

Neponset river

cost data on the work of improving the Neponset river in Massachusetts, E. M. Blake, il Eng & Contr 43:34-6 Ja 13 '15
Neponset river reclamation. W. B. Conant. il Munic J 39:254-5 Ag 19 '15

Nervous system

Diseases

Nerves and the war. A. Eulenburg, Sci Am 112:214 Mr 6 '15

Insects' nests. il Sci Am S 80:212-13 O 2 '15

Net fabric. See Knit goods

Netherlands

Flooring the sea with concrete, W. J. L. Kiehl, il Sci Am 113:461 N 27 '15

Industries and resources

upply of the Netherlands with ele energy, Elec R & W Elec'n 67:30 Jl 3 electric

Neumann's method

Factor to be used for the calculation of the phosphoric acid in Neumann's method. S. L. Jodidi and E. H. Kellogg. J Fr Inst 180: 349-67 S '15

Neuralgia

Cause of neuralgia. L. K. Hirshberg. Sci Am 111:505 D 19 '14

Neutral zone. See Heating-Tables, calculations, etc.

Nevada

Nee also Geology—Nevada; Mines and mineral resources—Nevada

Nevada (battleship) United States dreadnought Nevada. il Sci Am 113:424 N 13'15

New England association of gas engineers
45th annual meeting, Boston, Feb. 18, 1915.
Am Gas Light J 102:121 F 22 '15
History of the first American gas association.
E. C. Learned, Am Gas Light J 102:129-35
Mr 1 '15

New England question box convention. See National electric light association, New England section

New England water-works association 34th annual convention, New York city, Sept. 7-9. Eng N 74:566-8 S 16 '15 34th annual convention, New York city, Sept. 7-9. Munic J 39:443-6 S 16 '15

New Jersey

Coast

Coast erosion and protection on Long Island and New Jersey, G. (). Case, 1 74:348-51, 388-91, 438-42 Ag 19-S 2 15

New Jersey society of sanitary engineering Organization. Dom Eng 71:184 My 15 '15 2d quarterly meeting, Paterson, N. J., Oct. 30. Dom Eng 73:185 N 6 '15 2d quarterly meeting, Paterson, Oct. 30. Metal Work 84:596-7 N 5 '15

New Jersey state association of master plumbers

ers 14th annual convention, Trenton, N. J., May 25-27. Dom Eng 71:282-4 Je 5 '15 14th annual convention, Trenton, May 25-27. Metal Work 83:821-2 Je 4 '15

New Jersey zinc company
Accident prevention by the New Jersey zinc
co. B. F. Tillson, Eng & Min J 98:1034-9 D
12 114

New London, Connecticut

Bridges

New Haven road to build new Thames river bridge. Eng N 74:1053 N 25 '15

Wharves

Connecticut shipping terminal at New London, W. E. Clarke, il diags Eng N 74:1028-32 N 25 '15

New Mexico

Antiquities

Curiosities of bygone ages: relics from New Mexico and from Bible lands. il Sci Am 112: 87 Ja 23 '15 Prehistoric irrigation canal in New Mexico. S. M. Johnson. il Eng N 73:561 Mr 25 '15

Industries and resources

Geology of the Burro mountains copper district, New Mexico. R. E. Somers. il maps Am Inst Min E Bul 101:957-96 My '15; Discussion. 108:2476 D '15
Meerschaum deposits of New Mexico. F. V. Bush, il map Eng & Min J 99:941-3 My 29

New Mexico Mines and mineral resources-

New Orleans

Architecture

Post office, New Orleans, J. G. Rogers, il Arch & Bldg 47:131-6 Ap '15

Hurricane, 1915 Engineering aspects of New Orleans hurri-cane. W. H. P. Creighton. Eng N 74:710 O

Meteorology of West Indian hurricane, Sept. 22-Oct. 2. Eng N 74:710-12 O 7 '15

New Orleans record for succession of s broken, map Eng Rec 72:562-3 N 6 '15

Performance of the New Orleans water, sewerage and drainage systems during the recent hurricane. G: G. Earl, Eng & Contr 44:387-9 N 17 '15

Structural damage slight in New Orleans storm. J. F. Coleman and W. H. P. Creighton. Eng N 74:765-6 O 14 '15

Sanitary affairs

Concrete a plague-eradicator in New Orleans H. P. Letton, Eng Rec 71:325-6 Mr 13 '18

Sewerage

Method and cost of making house connections to the New Orleans sewerage system. Eng & Contr 42:203-4 Ag 26 '14

Sewerage and water board

Water and sewer maintenance in New Orleans. il Munic J 39:354-6 S 2 '15

Water supply

New Orleans water consumption. Munic J 39: 255-6 Ag 19 '15

Wharves

Concrete warehouses and terminal plant at New Orleans will cover 100 acres. il plan Eng Rec 71:402-3 Mr 27 '15

otton warehouse and terminal at Orleans, diag Eng N 73:1217 Je 24 '15

New Philadelphia, Ohio Causeway at New Philadelphia, Ohio. E: Stin-gel. il diag Eng Rec 71:78-9 Ja 16 '15

New York (city)
City planning in Queens borough, New York.
F. B. Tucker. map Eng N 74:638-41, 689-91
S 30-O 7 '15

Plan for the improvement of Hell Gate, East river. C. D. Ward. map Sci Am 112:432 My 8 '15

Aquarium

Collections of the New York aquarium, R. W. Shufeldt, il Sci Am S 80:52-3 Jl 24 '15

Architecture

Architectural treatment of special elevated stations of the dual system, New York city. S. J. Vickers, il Am Inst Arch J 3:501-2

N 13 Circle building, New York, il plan Arch & Bldg 47:282-8 Ag '15

See also Equitable building; Morgan building; Woolworth building

Bridges

Double-deck swingbridge floated in place, il

Double-deck swingbridge floated in place. il Eng N 74:437 S 2 '15 Draw span of Harlem river bridge floated to place. il Eng Rec 72:298-9 S 4 '15 Erecting the largest steel arch bridge in exist-ence, Hell Gate, New York, il Sci Am 113: 193 S 4 '15 Erection of Hell Gate, New York, il Sci Am 113:

193 S 4 '15
Erection at Hell Gate arch checks calculations, il Eng Rec 72:220-1 Ag 21 '15
Erection of the world's greatest steel bridge at Hell Gate, il Iron Tr R 57:944-5 N 11 '15
Fabricating steelwork for the Hell Gate arch, il Eng Rec 70:684-6 D 26 '14
Heavy travelers erect Hell Gate arch over East river, il Eng Rec 71:568-70 My 1 '15
Hell-Gate arch bridge and the New York Connecting railroad, il diag map Ry R 57: 453-61 O 9 '15

Connecting railroad, il diag map Ry R 57; 453-61 O 9 '15
Hell Gate arch erection from Ward's Island started; views. Eng Rec 71:789 Je 19 '15
Largest arch bridge in the world; Hell Gate bridge. il Sci Am 113:340-1+ O 16 '15
977-ft. Hell Gate bridge becomes an arch. il Eng N 74:708-9 O 7 '15
Progress on Hell Gate bridge. il Eng N 74: 236-7 Jl 29 '15
Progress on the Hell Gate bridge. il Ry Age 59:865-7 N 5 '15
Record set for weight of steel erected in one day at Randall's island on Hell Gate bridge approach. il Eng Rec 71:399-400 Mr 27 '15
Six etclings of Prooklyn bridge, by H. De Ville; text by M. Stapley. Arch Rec 38:583-91 N '15
Wood block and granite for bridge floors. E: A.

91 N 15 Wood block and granite for bridge floors. E: A. Byrne. il diags Munic Eng 48:337-9 Je '15 World's longest arch, across Hell Gate, New York city, is closed and swung as planned. il Eng Rec 72:438-40 O 9 '15

Buildings, Bureau of

New system of filing building plans saves time. Eng Rec 72:596 N 13 '15

Clubs

Addition to the New York Harvard club. J: T. Boyd, jr. il diags Arch Rec 38:615-30 D '15 Yale club's new house. M. Wilcox, il plans Arch Rec 38:310-42 S '15

Court house

Daylighting facilities of new court house. L. B. Marks and J. E. Woodwell, Illum Eng Soc 9:661-6 no 7 '14

Education

Learning through doing. Sci Am 112:624 Je 26

Employees

Standardizing engineering positions and salaries in New York city. Eng N 73:54-5 Ja 14

Lighting

igh intensity street lighting of European cities compared with New York, C. F. La-combe, il Illum Eng Soc 9:614-32 no 7

Maps waps
City planning in Queens borough, New York,
F. B. Tucker, maps Eng N 74:889-91 O 7 '15
First complete official map of New York city.
il Eng Rec 71:666-7 My 22 '15
Mammoth new map of the city of New York,
Eng N 73:991-2 My 20 '15
New York city's twenty-five foot map. C: W.
Person. il Sci Am 112:375 Ap 24 '15

Ordinances, etc.

New electrical code for New York. Elec R & W Elec'n 67:756-7 O 23 '15 Regulations governing refrigerants in New York city. Power 40:862 D 15 '14

#### New York (city) -Continued

#### Police

Future of the police arm from an engineering standpoint; with discussion. H: Bruère. Am Soc M E J 37:77-81 F '15; Same. Sci Am S 79:174-5 Mr 13 '15

### Public service commission laboratory

Standard practice instructions for concrete testing laboratory, R. E. Goodwin, il Eng N 73:202-8 F 4 '15

#### Public works

New municipal asphalt plant for borough of Manhattan. H: W. Durnam. il diag plans Eng N 73:1074-7 Je 3 '15

## Railroads

Developments at the Grand Central terminal in New York, il plan Ry R 57:223-34 Ag 21 New York freight terminals, 1914. Ry Age 59: 395-7 Ag 27 15

#### Rapid transit

Brooklyn bridge subway connection, New York city, il map Eng Rec 71:76-7 Ja 16 '15 Design of steel elevated railways, N. Y. rapid transit system. M. E. Griest, il diags Eng N 73:971-7 My 20 '15 Detail and fabrication of Harlem river tubes, T: Duckworth, il diags Eng Soc W Pa 31:

Detail and fabrication of Harlem river tubes.

T: Duckworth. il diags Eng Soc W Pa 31:
538-60; Discussion. 31:560-83 O '15
Development of New York's rapid transit system resulting in dual contracts. map Eng
Rec 72:572-4 N 6 '15
Downtown union subway station, New York
city. il Eng N 74:333 Ag 12 '15
East river tunnel shields. il diag Eng N 74:
952-5 N 11 '15
Pleatric equipment of Ealmont tupnel cars il

Solution tunner solicids, it diag Eng N 74: 952-5 N 11 '15

Electric equipment of Belmont tunnel cars, it Elec Ry J 45:764-5 Ap 17 '15

Every type of subway construction but air tunnel used on Harlem river section, it plans Eng Rec 71:616-19 My 15 '15

Harlem river four-track subway tunnel, O. Hoff, it diags map Eng Soc W Pa 31: 517-37; Discussion, 31:571-83 O '15

How some problems in the New York elevated improvement work were solved, it diags Eng Rec 71:781-3 Je 19 '15

Laying new track under an old elevated railway platform, diags Eng N 73:1180-1 Je 17 '15

Mile and a half of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of track on New York elevated in the control of the control of track on New York elevated in the control of the

Way platform, diags Eng it 76,1750-17
Mile and a half of track on New York elevated line rebuilt in fourteen days. Il Eng Rec 72:363-4 S 18 '15
New subway and elevated car of the New York municipal railway corporation. Il diags Ry R 56:208-13 F 13 '15
New York municipal car. Il diags Elec Ry J 43:1261-7, 1327-33; 44:1376-81; 45:496-503, 872-80 Je 6-13, D 26 '14, Mr 13, My 8 '15 '5
New York rapid transit railway extensions. F. Lavis. il diags maps Eng N 72:665-70, 728-34, 782-8, 858-63, 950-2, 972-8, 1068-71, 1104-9, 1150-5, 1206-10, 1250-4, 1294-8 O 1-15, 29-N 12, 26-D 31 '14
New York subway tapped for new connections while carrying heavy traffic. il diags plan Eng Rec 72:255-7 Ag 28 '15
New York transit contracts. Eng Rec 70:662

New York transit contracts. Eng Rec 70:662 D 19

Ornamental concrete elevated railway, New York city. M. E. Griest, il diags Eng N 74: 913-18 N 11 '15

Overcrowding and health. Sci Am 112:244 Mr

Progress on the dual subway system, New York city. Ry R 56:118-19 Ja 23 '15

Railroads under and over the streets of New York, il diags maps Sci Am 113:46-7+, 64-5+, 96-7+, 142-3+ Jl 10-17, 3l, Ag 14 '15 Rapid steel erection on third track work, Second avenue elevated, New York, il diags Eng Rec 71:86-7 Ja 16 '15

Rebuilding elevated railways in New York city. il diags plan map Eng N 74:625-30, 683-7 S 30-O 7 '15

Section of New York elevated rebuilt under heavy traffic without an accident. il map Eng Rec 72:470-2 O 16 '15

Short subway section in New York involves many difficulties of design. J. Glaser. il diags Eng Rec 71:448-51 Ap 10 '15
Starting six tubes for two new East river subway crossings in New York. il diags Eng Rec 71:810-12 Je 26 '15
Stations for third track, New York elevated, placed above existing platforms. il diags Eng Rec 72:138-9 Jl 31 '15
Steel shields protect traffic during removal of New York subway roof. il Eng Rec 72:110-12 Jl 24 '15
Subway ventilation schemes. il diags Heat &

12 Jl 24 '15 Subway ventilation schemes, il diags Heat & Ven 12:13-16 Ag '15 Travel on New York transit lines and steam railroads. Elec Ry J 45:134 Ja 16 '15 Typical and special construction used on Queens extension to New York elevated, il diags Eng Rec 72:76-8 Jl 17 '15

See also New York railways

#### Real estate

New York tax list: fluctuation of real estate values due to lack of regulation of the char-acter of buildings. Am Inst Arch J 2:572-3 D

'14
Sanitary affairs

New methods of odor elimination at garbage plants indicated by New York tests. I. S. Osborn, Eng Rec 72:16-17 J1 3 '15

New York city sanitary code. Metal Work 83: 348 Mr 5 '15

New York city street-cleaning dumping dock completed, il Eng N 74:956 N I1 '15

Reduction of New York's garbage, il map Munic J 39:35-9 J1 8 '15

## Sewerage

Construction of the Metcalf ave. sewer, borough of the Bronx. G. L. Christian. il diags Eng N 72:1164-7 D 10 '14
Design and construction features of reinforced concrete sewer siphons under New York subways. T. L. Wilson. Eng & Contr 43:128-9 F

Disposal of Greater New York's sewage; general plans. C: E. Gregory. Munic J 39:692-4

Main drainage works proposed for New York. G: A. Soper, il maps Boston Soc C E J 1:31-66 F '14

## Streets

Manhattan pavements limited to three standard types. H. W. Durham. Eng Rec 71:202-3 F 13 15
Methods introduced in New York last winter cut cost and increased speed of snow removal. J: T. Fetherston. il Eng Rec 71:640-1 My 22 15

ew York city experience with asphalt block pavements. E. J. Morrison. Eng N 73:645-6

 $\stackrel{ ext{Ap 1}}{ ext{York}}$  street cleaning. il Munic J 39:842-New

New York street cleaning, if Munic J 33:342-4 1) 2 15
New York's snow removal plans, if Munic J 37:327-9 D 10 '14
Snow removal in New York, if Munic J 38: 805-7 Je 10 '15
Street cleaning in New York, if Munic Eng 48:

46-8 Ja '15 Street work in New York. Munic J 39:3-4 Jl

1 '15 Underground pipes in New York city streets. Eng N 74:280-1 Ag 5 '15 Value of paving materials disclosed by two years' service test. H. W. Durham. Eng Rec 71:203-4 F 13 '15

# Subway collapse, 1915

Collapse of streets in New York city during subway construction. il Ry R 57:434 O 2 '15 Collapse of the subway work on Seventh avenue. il Sci Am 113:295 O 2 '15 Comparative timbering costs in mine and subway. diag Eng & Min J 100:689-90 O 23 '15

Danger of collapse in subways is not general. F. Lavis. Eng N 74:666-7 S 30 '15

Dynamite explosion causes new subway cavein in New York, il Elec Ry J 46:631-2 S 25
'15

Not merely mining but bridge building; the importance of diagonal bracing in subway timbering. il diags Sci Am 113:324 O 9 '15

New York (city)—Subway collapse—Continued Proper timbering would have prevented sub-way collapse. J. Seward. Eng N 74:758-9 O

Public-service engineers on New York subway accidents. Eng N 74:762-3 O 14 '15
Recommendations for safety of subway timbering. Eng N 74:716 O 7 '15
Rock slide causes second collapse of subway decking. Eng Rec 72:429+ O 2 '15
Rock slides greatest menace to New York subway work; report of E. S. Davis and H: H. Quimby. Eng Rec 72:461+ O 9 '15
Subway timbering accidents; two New York streets fall. il diags Eng N 74:662-6 S 30 '15
Timbering in New York subway. J: Seward; P. E. Barbour. Eng & Min J 100:686-7 O 23 '15
Timbering in the New York subway. P. E.

Timbering in the New York subway. P. E. Barbour, il diags Eng & Min J 100:568-70 O

## Subway fire, 1915

Disastrous burnout in a subway manhole. Sci Am 112:66 Ja 16 '15
Subway fire inquiry and orders. Elec Ry J 45:148-9 Ja 16 '15
Unjust criticism of the subway system of New York. Sci Am 112:62 Ja 16 '15
Where the smoke helmet would be invaluable: a lesson from the New York subway fire. il Sci Am 112:65 Ja 16 '15

# Water supply

Water supply

Conditions encountered and methods employed in laying water pipes in the congested streets of New York city. M. Blatt. Eng & Contr 44:246-7 S 29 '15

Improving sanitary conditions on the Ashokan reservoir watershed. G: G. Honness. Eng & Contr 44:213 S 15 '15

Maintenance of the water supply distribution system of New York city. W: W. Brush. il maps Am Water Works Assn J 2:206-37 Mr '15; Same cond. Eng & Contr 44:44-7 JI 21 '15; Discussion. F. B. Nelson. Am Water Works Assn J 2:306-10 Je '15

Steudson Calledia Calledia Contractions of the Steudson Calledia Cal

Seculso Catskill aqueduct

#### Wharves

Congestion of freight at New York piers. il Int Marine Eng 20:80 F '15 Hunt's Point terminal in New York involves

Hunt's Point terminal in New York involves difficult bulkhead construction. Il diags map Eng Rec 72:104-6 Jl 24 '15
New York's new piers. Il diags Engineer 120: 193-5, 204 Ag 27 '15
Notable step in the building of New York's great piers. R. G. Skerrett. Il Sci Am 113: 160-1 Ag 21 '15
Steamship terminal in the Bronx, Il diag maps

Steamship terminal in the Bronx. il diag maps Sci Am 112:80-1 Ja 23 '15

New York (state)

Secret r Reads New York

### Constitution

Committee of engineers recommends amend-ments to the New York constitution. Eng N 73:842 Ap 29 '15; Same. Eng & Contr 43:421-2 My 12 '15; Same. Eng Rec 71:561-2 My 1

'15
Engineers and the New York state constitutional convention. Eng N 73:602-3 Mr 25 '15
Engineers discuss changes in New York state constitution. Eng Rec 71:382 Mr 20 '15
Engineers present open letter to chairman of New York constitutional convention. Elec R & W Elec'n 67:484 S 11 '15

Engineers' recommendations for amendments to the New York constitution, Eng N 73: 834-6 Ap 29 '15

## Highway department

eed, preparation and utility of statistical records in a highway department, P. P. Far-ley, Eng & Contr 44:187-9 S 8 '15 statistical

State-wide survey locates road-making materials in New York. Eng Rec 71:488-9 Ap 17 '15

New York Central & Hudson River railroad Annual report, Ry Age 58:683-5, 722-4 Mr 26 '15 Electrification, E. B. Katte, W Soc E J 20:318-22 Ap '15

Rail sections as one element in steam and electric traction. P. H. Dudley. diags Gen Elec R. 17:1036-46 N '14; Same. Sci Am S 78:362-3, 370-1 D 5-12 '14

New York connecting railroad Construction, il diags map Ry Age 59:421-5 S

ell-Gate arch bridge and the New York connecting railroad, il diag map Ry R 57: 453-61 O 9 '15 Hell-Gate

New York electric railway association 33d annual convention, June 29-30. Elec Ry J 46:14-20 Jl 3 '15

20th quarterly meeting at Lake George, March 2-3. Elec Ry J 45:464-7 Mr 6 '15

New York master printers' association
Address to the members of the New York
master printers' association, C. F. Crawford,
Inland Ptr 54:819-20 Mr '15

Inland Ptr 54:819-20 Mr '15

New York, New Haven & Hartford railroad
Annual report for the year ending June 30,
1915, map Ry Age 59:790-2, 830-6 () 29 '15

Conditions affecting the success of main line
electrification. W. S. Murray, il Am Inst E E
Pro 34:1873-1913 Ag '15; Same. J Fr Inst
179:513-57 My '15; Same cond. Elec Ry J 45;
229-31 Ja 30 '15; Same cond. Ry Age 58:923-8
Ap 30 '15; Discussion. Am Inst E E Pro 34:
1913-32 Ag '15; Same. J Fr Inst 180:75-99
J1 '15

Electrification, W: S. Murray, W Soc E J 20:

Electrification, W; S. Murray, W Soc E J 20: 322-7 Ap '15
New England and the New Haven road, H. Elliott. Ry Age 58:881-2 Ap 23 '15
New Haven operating results. Elec Ry J 46: 101-2 Jl 17 '15
New Haven road to build new Thames river bridge. Eng N 74:1053 N 25 '15
Overhead contact systems, construction and costs. E. J. Amberg. pls Am Inst E E Pro 34:1255-66 Je '15; Abstract. Elec Ry J 46:56
Jl 10 '15

New York public service commissions New York commissions. Elec W 65:375 F 6 '15 Public service commission inquiry. Elec Ry J 45:302, 389, 430-1, 477, 521 F 6, 20-Mr 13 '15

New York railways Annual report for the fiscal years ended June 30, 1914 and 1915. Elec Ry J 46:885 O 23 '15

New York state association of master plumbers 27th annual convention. Syracuse, March, 1915. Dom Eng 70:348-50 Mr 13 '15 27th annual convention, Syracuse, March, 1915. Metal Work 83:443-4 Mr 19 '15

New York state barge canal

Barge canal navigation aids. Eng N 74:253 Ag 5 '15

Concrete construction on the New York state barge canal, G; C. Mills, il diags Concrete Cem 6:205-7 Ap '15

Concrete plant for Barge canal lock, il diags Eng N 73:1078-9 Je 3'15

Construction of the Barge canal crossing of Oak Orchard creek. E. Low. il diags Eng N 73:430-2 Mr 4 '15

Cost of the Erie barge canal, H. G. Moulton. Ry Age 59:91-2 Jl 16 '15

Cost of the New York barge canal. Eng N 73: 178-9 Ja 28 '15

Low headway on the New York barge canal as a hindrance to traffic, F. L. Neall, Eng N 72:1226 D 17 '14

New York barge canal, in miniature, operates at exposition, il Eng Rec 71:539 Ap 24 '15

Waterway rivaling in some respects the Pan-ama canal. R. F. Yates. il map Sci Am III: 492-3 D 12 '14

Waterways from the Great Lakes to the Atlantic. Eng N 73:132-3 Ja 21 '15

New York state conference of mayors Sixth annual conference, June 1-3. Munic J 38: 819-20 Je 10 '15

New York state motor federation New state federation formed in New York. Horseless Age 31:N63-4 D 16 '14

New York state railways Results obtained by instruction department, New York state railways, Rochester lines. G: Lawson. Elec Ry J 45:367-9 F 20 '15

New York times

Use of electricity in a newspaper plant: motor and control equipment for production of New York times, il Elec W 65:1627-31 Je 19

New York, Westchester and Boston railway

ew York, Westchester and Boston railway Catenary construction. S. Withington, il diags plans J Fr Inst 178:705-42 D '14
Construction, maintenance and cost of overhead contact systems; catenary construction. F. Zogbaum, Am Inst E E Pro 34:1267-81 Je 15; Abstract, Elec Ry J 40:56-7 Jl 10 15
Saving power by watt-meter records. Elec Ry J 46:822-3 O 16 15

Signal maintenance methods. il Elec Ry J 45:

561-5 Mr 20 '15

New York zoological park Rare amphibians at the New York zoological park, il R. L. Ditmars, Sci Am S 80:196 S 25-115

#### New Zealand

See Hydroelectric plants-New Zealand

Newark, New Jersey
Proposed new charter for Newark, Munic
Eng 49:140 O '15
Three years' growth of street traffic in Newark, H. Eartholomew, Eng N 74:538-9 S 16
'15

# Rapid transit

Newark railway terminal and utilities building, it plans Eng N 74:886-40 0 28 15 Newark terminal to relieve traffic congestion, diag maps Eng N 74:680-2 O 7 '15

#### Sewerage

New methods of pneumatic tunneling aid safe and rapid completion of Passaic valley sewer contract, il diags Eng Rec 71:130-3 Ja 30 '15

Water supply

Unique water-supply, il Eng N 73:863-5 My 6

#### Wharves

Newark is rapidly creating its own water terminal in New Jersey meadows, il diags plan Eng Rec 72:201-3 Ag 14'15

Newell, Frederick Haynes, 1862-New professor of civil engineering, University of Lilners for Ry R 50:062-3 My 10:15. Mome Eng 48:313 My '15

Newfoundland

ewfoundland's mineral resources. P. B. Mc-Donald. map Eng & Min J 100:674-5 O 23 '13

News associations. See Associated press

Newspaper offices

wspaper offices were seen work was press building, St. Joseph, Mo.; views and plans. Arch Rec 37:560-2 Je '15 Sec also New York Times

Newspapers

Advertising service of the weekly. Inland Ptr 55:475-7 J1 '15 Boosting the advertising patronage in a local paper. C. L. Chamberlin. Inland Ptr 55:761-5

Conflict between news and advertising. J. C. Morrison. Inland Ptr 54:681-4 F '15 Game of killing off your competitor. J. C. Morrison. Inland Ptr 54:540-1 Ja '15

Increasing newspaper circulation. B. O. Brown. Inland Ptr 55:182-4 My '15 Newspaper survey. J. C. Morrison. Inland Ptr 55:537-8 Jl '15

Newspaper work, J. C. Morrison, See monthly numbers of Inland printer Press and the rate advance case. Ry Age 58:  $776~\mathrm{Ap}~9~^{\circ}15$ 

Review of newspapers and advertisements.
J. L. Frazier. See monthly numbers of In-

land printer Solicitor wanted for country weeklies: sub-scription price. J. C. Morrison. Inland Ptr 55: 241-4 My 15

Some subscription suggestions. J. C. Morrison, Inland Ptr 55:85-7 Ap '15 Unlimited possibilities of the live country newspaper. A. G. Brenton. Inland Ptr 54:412 D '14

Why do we lose money on special editions? J. C. Morrison, Inland Ptr 56:390-1 D '15 \*\*Nee also Advertising; Journalism; Public-ity; Reporting; Waste paper; also New York

Niagara falls Intermittent waterfall; using the power of Niagara falls without impairing its scenic beauty. E. Dunn. il Sci Am 113:492-3+ D 4

Nickel

Canada's nickel trouble. Eng & Min J 99:30-1

Cobalt and nickel assay. S. Fischer, jr. Met & Chem Eng 12:773-4 D '14

Cobait and nicket assay. S. Fischer, jr. Met & Chem Eng 12:773-4 D' '14

Nickel, copper and mercury as affected by the war. J Ind & Eng Chem 7:71-2 Ja '15

Welding up scrap nickel anodes. il Elec R & W Elec'n 66:1210-11 Je 26 '15; Same. Eng & Min J 100:19 Jl 3' 15; Same. Foundry 43:283-4 Jl '15; Same. Met & Chem Eng 13:453-4 Jl '15; Same cond. Iron Age 95:1392 Je 24 '15; Same abr. Metal Ind n s 13:297 Jl '15

See also Illium; Nickel chromium; Nickel

Nickel chromium Court of appeals decision in nickel-chromium resistor suit. Met & Chem Eng 13:414-15 Jl

Nickel oxide

Emissivity of metals and oxides: nickel oxide
(Ni O) in the range 600° to 1300° C. G. K.

Burgess and P. D. Foote, diags U S Eur
Stand Bul 11:41-64 N 15 '14

Nickel plating

ickel plating
Aluminum-nickel, J. Canac and E. Tassilly.
Eng M. 19:273-1 My '15
Bar nickel anodes vs. flat. J. A. Hall. Metal
Ind n s 13:336 Ag '15
Determining weight of deposit. L. C. Wilson.
Metal Ind n s 12:505-6 D '14
Development of nickel plating. E: Weston. J.
Ind & Eng Chem 7:249-50 Mr '15
Efficiency in the plating room. E. P. Later. il
Foundry 43:360-5 S '15
Methods used by platers to produce bright
nickel deposits. C: H. Proctor. Metal Ind n s
13:57 F '15
Nickel-plating aluminum. Elec B & W. Elec'n

13:57 F '15 Nickel-plating aluminum, Elec R & W Elec'n 66:1056 Je 5 '15 Nickel-plating on aluminium, Sci Am S 80: 197 S 25 '15 The troublesome die-castings.

Plating of the troublesome die-castings. S. Herrick. Metal Ind n s 13:373-4 S '15 Successful nickel plating of die castings or articles made from sheet zinc. C: H. Proctor. Metal Ind n s 13:274 Jl '15

Nickel silver. See German silver

Nickel steel

Data on nickel steels. G. W. Armstrong. Eng & Contr 44:53-4 Jl 21 '15

Longest simple truss span in world to be erected over Olio river at Metropolis. diag Eng Rec 72:53-4 Jl 10 '15

Night work

How to organize your night force. H. C. White. Iron Tr R 56:1056-8 My 27 '15; Same. Iron Age 95:1174-6 My 27 '15; Same. Ind Eng 15:95-7 S '15; Abstract. Mach 21:905 J1 '15

Nitrates

litrates

Binary and ternary systems of the nitrates of the alkali and alkaline earth metals. W: D. Harkins and G: L. Clark. Am Chem Soc J 37:1816-28 Ag '15

Determination of nitrates in soil. R. S. Potter and R. S. Snyder. J Ind & Eng Chem 7:863-4 O '15.

Titration of nitrates with ferrous sulfate. F. C. Rowman and W. W. Scott and R. Eng Chem 7:766-9 S '15

Nitric acid

Action of nitric acid on iodoanil. L. Clarke and E. K. Bolton. Am Chem Soc J 36:1899-1908 S '14

Boiling-point of aqueous solutions of nitric acid at different pressures. H: J. M. Creigh-ton and J: H. Githens. diag J Fr Inst 179: 161-9 F'15

Germany's nitrate supply. Sci Am 112:216 Mr

Nitric acid -Continued

Strength of nitric acid, period of extraction, and ignition as affecting the gravimetric determination of phosphoric acid in soils. O. L. Brauer. J Ind & Eng Chem 6:1004-5 D '14 Synthetic production of nitric acid. Sci Am S 80:203 S 25 '15

Nitrobenzene

Studies of a new kind of e.m.f. R. Beutner. diags Am Chem Soc J 36:2040-59 O '14

Nitrocarbopyrrolic acid Constitution of the nitro-α-carbopyrrolic acids. W: J. Hale and W: V. Hoyt, Am Chem Soc J 37:2538-52 N '15

Nitrocellulose

Chemical engineering in nitrocellulose manufacture. S. L. Stadelman. Met & Chem Eng 13:361-6 Je '15

13:361-6 Je '15
Contributions of the chemist to the celluloid and nitrocellulose industry. R. C. Schüpphaus. J Ind & Eng Chem 7:290 Ap '15
Proximate analysis of nitrocellulose solutions and solvents. A. D. Conley. J Ind & Eng Chem 7:882-7 O '15

American nitrogen industry. Eng N 73:557 Mr 18'15

Availability of organic nitrogen, J. E. Breck-enridge, il J Ind & Eng Chem 7:671-3 Ag '15 Carbonitride furnace, diag Met & Chem Eng 13:642 S 15 '15

Carbon tritle Turnet, dag let to Chem 213:642 8 15 '15
Chemical industries of Germany, P. F. Frankland, Met & Chem Eng 13:382 Je '15; Same. Sci Am S 79:390 Je 19 '15
Commercial nitrogen fixation; with discussion. S. Peacock, Met & Chem Eng 13:325-6 My

Comparison of the Gunning-copper method with the Kjeldahl-Gunning-Arnold method for the determination of nitrogen. O. F. Jensen. J Ind & Eng Chem 7:38-9 Ja '15
Comparison of various modifications of the

omparison of various modifications of the Kjeldahl method with the Dumas method of determining nitrogen in coal. A. C. Fieldner and C. A. Taylor. J Ind & Eng Chem 7:106-12 F '15: Same. U S Bur Mines Tech Pa 64: 1-22 '15

Cyanamid process. F. S. Washburn, Met & Chem Eng 13:309-14 My '15
Cyanamid works at Niagara Falls, il plan Eng N 73:16-21 Ja 7 '15
Determination of nitric nitrogen in soils. E. R. Allen, diags J Ind & Eng Chem 7:521-9 Je '15

Determination of nitric nitrogen in soils. E. R. Allen. diags J Ind & Eng Chem 7:521-9 Je 115. Allen. diags J Ind & Eng Chem 7:521-9 Je 115. Allen. diags Am Inst E E Pro 34:337-71. Mr 115. Abstract, with discussion. Met & Chem Eng 13:241-3 Ap 115. Discussion. Am Inst E E Pro 34:2656-61 N 115. Fixation of atmospheric nitrogen. Sci Am S 79:388 Je 19 115. Fixation of atmospheric nitrogen. W. S. Landis. il J Ind & Eng Chem 7:433-8 My 15; Same. Met & Chem Eng 13:213-20 Ap 115. Fixation of atmospheric nitrogen: a patent by S: Peacock. Met & Chem Eng 13:213-20 Ap 115. Improved method for the determination of nitrogen in steel. L. E. Barton. J Ind & Eng Chem 6:1012-13 D 114. Kjeldahl-Gunning-Arnold method for nitrogen. J. M. Pickel. J Ind & Eng Chem 7:357 Ap 115. New nitrogen fixation furnace. diags Eng M 49:104-5 Ap 115. Occurrence and influence of nitrogen on iron and steel; abstract and discussion. N. Tschischewski. Iron Age 96:952-4 O 21 115; Engineer 120:334-5 O 8 115. Oxides of nitrogen from air; patent of F. I. du Pont. Met & Chem Eng 13:642 S 15 115. Plumboxan process for producing oxygen and nitrogen from atmospheric air: abstract. G. Kassner. Am Soc M E J 37:119 F 115. Producing nitrogen compounds; discussed by the New York section of the A. I. E. Elec W 65:729 Mr 20 115; Elec R & W Elec'n 66:536 Mr 20 15. Recent advances in the chemistry of the cyanogen compounds. J. E. Clennell. Am Inst Min E Bul 106:2120-3 O 15; Same. Met & Chem Eng 13:756 O 15 125.

Nitrogen compounds

Free energy of nitrogen compounds. G. N. Lewis and E. Q. Adams. Am Chem Soc J 37:2308-16 O '15

Nitrogen lamps. See Electric lamps, Tungsten

Nitro-hydroxycinnamic acid

3-nitro-4-hydroxycinnamic acid and its methyl ether. T. B. Johnson and E: T. Kohmann. Am Chem Soc J 37:162-7 Ja '15

Nitroso compounds

Nitroso derivatives of semicarbazinodiacetic acid esters. J. R. Bailey and D. F. Snyder. Am Chem Soc J 37:942-6 Ap '15

Nitrosulphonic acids

Tolyl esters and toluidides of the nitro-sulfonic acids of p-xylene. R. C. Huston, Am Chem Soc J 37:2119-22 S '15

Nitrotyrosine

Studies on nitrated proteins: the determination

Studies on nitrated proteins: the determination of the structure of nitrotyrosine. T. B. Johnson and E: F. Kohmann. Am Chem Soc J 37:1863-84 Ag '15 Studies on nitrated proteins; the identification of 3-nitrotyrosine among the products of hydrolysis of nitrated fibroin. T. B. Johnson. Am Chem Soc J 37:2598-603 N '15

Noble, Alfred, 1844-1914 Past-president, W. S. E.; memoir. por W Soc E J 20:558-607 S '15

Noble, Sir Andrew, 1831-1915 Sketch. por Engineer 120:406-7 O 29 '15

Nodulizing in copper metallurgy. J. H. Payne. Eng & Min J 99:272-4 F 6 '15

Noise

olse Reduction or elimination of noise attending the operation of mechanical ventilating machinery. R. W. Pryor, jr. plans Heat & Ven 11:26-9 Ag '14; Same. Am Soc Heat & V E 20:320-5 '14; Same. Iron Age 94:210-11 Jl 23 '14; Same. Metal Work 82:275-6 S 4 '14; Discussion. Am Soc Heat & V E 20:325-9 '14; Discussion. Heat & Ven 11:44-5 N '14

Nolachuckey river
Design low dam for 30-foot height increase
across Nolachuckey river. W. V. N. Powelson, il Eng Rec 71:175-6 F 6 '15

Nomographs

omographs
Nomographic charts for Kutter's formula.
G. S. Coleman. Eng Rec 72:489 O 16 '15
Nomographic charts for simple beam design.
C: D. Conklin, jr. Eng Rec 71:809 Je 26 '15
Nomographic solutions for formulas of various types. R. C. Strachan. Eng Rec 71:807-9 Je

Nonane

Normal nonane, L. Clarke and R. Adams, Am Chem Soc J 37:2536-8 N '15

Norfolk, Virginia

Sanitary affairs

Garbage collection and incineration at Norfolk, Va. W: R. Russell. il diags Munic J 38:183-5 F 11 '15

Norfolk & Western railroad

lorfolk & Western railroad
Automatic signals on Norfolk & Western electrified line. il Ry Age 59:21-2 Jl 2 '15
Building low-grade line for Norfolk & Western R. R. il map Eng N 74:818-21 0 28 '15
Electric traction on the Norfolk & Western railway. il diag plans Eng N 73:1192-5, 1238-43 Je 17-24 '15
Electrification. il Power 41:830-5 Je 22 '15
Electrification. il plans map Elec Ry J 45: 1058-69 Je 5 '15

Electrification. il plans map Elec Ry J 45: 1058-69 Je 5 '15
Electrification of the Elkhorn grade. il plans Ry R 56:756-61, 791-7; 57:101-7, 150-2 Je 5-12, Jl 24-31 '15

S 79:372-4 Je 12 '15 Elkhorn grade. il Sci Am S 79:372-4 Je 12 '15 Elkhorn grade electrification. il diags map Ry Age 58:1153-63 Je 4 '15

Financial condition, map Ry Age 59:491-2 S

17 '15d for railway electrification has been developed by the Norfolk & Western. il Eng Rec 71:704-6 Je 5 '15

Norfolk & Western and Pennsylvania electrifi-cations. G: Gibbs. W Soc E J 20:308-14 Ap '15

Northern Pacific railway
Annual report for the fiscal year ended June
30, 1914, map Ry Age 58:611-13, 650-4 Mr 19

Northern Pacific railway—Continued

Northern Pacific Ry. near Tacoma—new coast
line, il diags map Eng N 73:562-5 Mr 25 '15

Point Defiance line eliminates last heavy
grade between Tacoma and Portland. D: L.
Soltan. map Eng Rec 71:744-5 Je 12 '15

Northern white cedar association

19th annual convention, Minneapolis, Jan. 26. Elec R & W Elec'n 66:254-6 F 6 '15 19th convention, Minneapolis, Minn., Jan. 26 and 27, 1915. Elec W 65:369 F 6 '15

Northwest

Industrial resources and opportunities of the Northwest, H. K. Benson, Met & hem Eng 13:589-92 S 15 '15; Same, J Ind & Eng Chem 7:981-4 N '15

Northwest electric light and power association 8th annual convention, Portland, Ore., Sept. 8-11. Elec R & W Elec'n 67:528-34 S 18 '15 8th annual convention, Portland, Ore., Sept. 8-11. Elec W 66:567-9, 624-6 S 11-18 '15

Norwalk, Connecticut

Water supply

Seven years' successful operation of double sand filtration plant at South Norwalk, Conn., in removal of objectional tastes and odors, H. W. Clark. Eng & Contr 44:262-3 O 6 '15

Norway

Industries and resources

Grong copper and pyrites mines of Norway. A. D. Udhany, il map Eng & Min J 99:889-92 My 22'15

See also Water power-Norway

Notes. See Bills and notes

Nottingham, England To make Nottingham a port. Sci Am S 79:342 My 29 '15

Sewerage

How the city of Nottingham solved its sewage disposal problem. C. M. Hitch. Dom Eng 72:377-8 S 25 '15; Same. Metal Work 84: 399 S 24 '15
Sewage disposal at a profit in Nottingham, Sci Am 113:442 N 20 '15

Noyes, Arthur Amos, 1866-Gibbs medal award. W. D. Harkins; J. St litz. por J Ind & Eng Chem 7:449-50 My Stieg-

Nozzles

Binks spray nozzle, diag Power 42:380 S 14

Calculation of the Laval nozzle by the PV diagram; abstract. A. Balog. Am Soc M E J 37:481-2 Ag '15

37:481-2 Ag '15 xx busy the street of the st

See also Carbureters

Nuisances

Power plants as nuisances. A. L. H. Street. Power 42:436-7 S 28 '15

Curious property of numbers, J. Bowden. Sci Am S 79:371 Je 12 '15

See also Numerals Numerals

How we got our alphabet: the numerals. W. Rice. Inland Ptr 55:389-90 Je '15 See also Numbers

Nurses and nursing

See also First aid in illness and injury

Nutrition

New era in the science of nutrition; experiments of T: B. Osborne and L. B. Mendel. R. L. Kahn. Sci Am S 79:182-3 Mr 20 '15

Salt and its relation to nutrition, P. G. Stiles. Sci Am S 79:295 My 8 '15

Sec also Food: Metabolism

Nuts (machinery). See Bolts and nuts

Nystagmus

Nystagmus (trembling of the eyes) of the miners. Colliery 35:505 Ap '15

 $\bigcirc$ 

Oakland, California

Streets

City of Oakland, California, and its street work. W. H. Jordan. il Good Roads n s 10: 127-32 S 4 '15

Observatories, Astronomical. See Astronomical observatories

Occupational diseases. See Diseases, Industrial Occupations

Film may help in the selection of an occupation. Sci Am S 20:333 N 20 '15

Recognizing vocations from the teeth, il Sci Am S 79:300 My 8 '15

Selecting the right occupation, Eng N 74:321
2 Ag 12 '15

See also Business

Diseases and hygiene

See Diseases, Industrial; Foundry sanitation; Lead poisoning; Zinc poisoning

Formation of primitive oceans. Sci Am S 80: 211 O 2 '15 Seeing under water. il diags Sci Am S 80:97, 101 Ag 14 '15

Ree also Commerce; Dredging machinery; Gulf stream; Icebergs; Sea walls; Sea water; Ships; Sounding; Waves

Ocymum pilosum Roxb Oil of ocymum pilosum Roxb. K. Bhaduri. Am Chem Soc J 36:1772-3 Ag '14 Odessa

Odessa,

the grain port of Russia. Sci Am S 79:3 Ja 2

Investigations on the nature and elimination of odors and dust from a garbage reduction plant. H. W. Mahr and A. C. Kraft, il diags J Ind & Eng Chem 7:778-85 S '15
Loss of weight of musk in a current of dry air, C: B. Bazzoni, diag J Fr Inst 180:463-9

air. C

Prevention of odors at city refuse disposal works, R. Hering, Eng & Contr 43:81-2 Ja

See also Perfumery

Office buildings Circle building, New York, il plan Arch & Bldg 47:282-8 Ag '15 Commonwealth Edison company formally

Commonwealth Edison company formally opens new headquarters in Edison building, Chicago. il Elec W 66:682-3 S 25 '15

Formal opening of Commonwealth Edison company's new office building, Chicago. il Elec R & W Elec'n 67:584-5 S 25 '15

Gas burners in 2750-hp. office-building boiler plant. il diag Power 42:79-80 Jl 20 '15

Heating and ventilating an office building by electricity: Hydraulic power co.'s plant at Niagara Falls. C. F. Herington, il diags plan tat Niagara falls. C. F. Herington, il diags plan Heat & Ven 12:18-22 Je '15

Heating and ventilating conditions in large office building. C. E. A. Winslow and G. F. Maglott. Heat & Ven 12:26-31 F '15

Heating and ventilation of offices and banking rooms. C: L. Hubbard. diags Brickb 23: 307-10 D '14

L. C. Smith building, Seattle, Wash, il plantar of the state o

307-10 D '14
L. C. Smith building, Seattle, Wash. il plan
Arch & Bldg 46:471-5 D '14
Land and loan office for H. C. Adams, Algona,
Ia.; plan. Arch & Bldg 47:68a F '15
New Commonwealth Edison building. il Elec
R & W Elec'n 66:1035-7 Je 5 '15
New Delaware and Hudson office building at
Albany, N. Y. M. T. Reynolds. il Concrete
Cem 6:289-93 Je '15

Office buildings-Continued

Office-building service ( Power 42:125-6 Jl 27 '15 data. W. R. Metz

Power 42:125-6 Jl 27 '15
Plumbing system of modern office building, il
plan Metal Work 84:279-80 Ag 27 '15
Power plant of the new Equitable building,
New York, il Elec W 66:81-5 Jl 10 '15
Small office building remodeled from a group
of old brick houses, il plans Brickb 24:73-4
Mr '15

Structural features of Northwestern-mutual life insurance building, Milwaukee. diags Eng Rec 71:205-7 F 13 '15
Types of elevator lobbies in office buildings. C. F. Baker. il plans Arch Rec 38:631-40 D

Vanderbilt concourse offices, il plans Arch &

Vanderbilt concourse offices. il plans Arch & Bldg 47:148-52 Ap '15 Widener building, Philadelphia, Pa. il plans Arch & Bldg 47:349-54 O '15 Wind stresses in the steel frames of office buildings. A. Smith, tables pls W Soc E J 20:341-64 Ap '15 Wind stresses in the steel frames of office buildings. W. M. Wilson and G. A. Maney, tables Ill U Eng Exp Sta Bul '0:1-xx '15; Abstract. Eng Rec 72:231-2 Ag 21 '15 Wind stresses in the steel frames of office buildings; with discussion. W. M. Wilson, tables pls W Soc E J 20:365-90 Ap '15 Work of the Chicago ventilation commission, il plans Heat & Ven 12:26-31 My '15

See also High buildings; Printing offices; also Equitable building, New York; Woolworth building, New York

### Lighting

Illumination systems for good lighting of offices, A. E. Oday and R. E. Harrington, il Elec W 65:814 Mr 27 '15

Office management

fficiency in conduct of office business; new methods in a naval bureau. Ry R 57:472-4

Handling correspondence at the United States department of state. W. Fawcett. il Inland Ptr 56:109-12 O '15
Minor points that are sometimes neglected. C. N. Stannard, Am Gas Light J 103:282-3
N 1 '15

Office helps for the master plumber. J: F. Scott. Dom Eng 71:66-7; 72:7-8 Ap 17, J1 3

'15 Office management. J. P. Brophy. Mach 22: 209 N '15 Office methods for the electrical contractor. Elec R & W Elec'n 66:550-2 Mr 20 '15 Office system and forms for the electrical contractor. C. M. Converse. Elec R & W Elec'n 67:150-2 Jl 24 '15

Scientific management in the office. R. T. Kent. Iron Age 95:82-6, 142-4 Ja 7-14 '15

Ogontz Hill, Philadelphia

tucco in suburban architecture—notes on Ogontz Hill, Philadelphia. O. C. Hering. il Concrete Cem 6:9-14 Ja '15

Ohio electric light association

convention at Cedar Point; relations with the public, experience with gas-filled lamps, and high-tension insulators among topics discussed. Elec W 66:219-20 Jl 24 '15

Meeting of the committee on new business co-operation. Elec R & W Elec'n 67:555-6 S 25

Meeting of the committee on new-business cooperations. Elec W 66:662 S 18 '15

Ohio central-station men meet in Cleveland. Elec R & W Elec'n 66:192-3 Ja 30 '15

21st annual meeting, Cedar Point, July 20-23. Elec R & W Elec'n 67:196-200 Jl 31 '15

Ohio master plumbers' association
Annual convention; discussion of federal indictment of officers and members. Metal
Work 83:302-4 F 19 '15

24th annual convention, Akron, O., Feb. 9-11. Dom Eng 70:212-15 F 13 '15

Ohio master sheet metal contractors' association st annual convention, Dayton, June 2-3. Metal Work 83:858-61 Je 11 '15

Ohio sheet metal contractors organize, Metal Work 83:235-6 F 5 '15

Ohio river

Port improvements along the Mississippi and Ohio rivers. Eng N 73:1066-8 Je 3 '15

Ohio state association of builders' exchanges 9th annual convention, Columbus, O. Bldg Age 37:47-9 Mr '15

Ohmmeter

Ohmmeter with several scales; abstract. H. A. W. Klinehamer. diag Elec W 65:37 Ja 2 '15

Oil analysis

il analysis
Iodine number of linseed and petroleum oils.
W. H. Smith and J. B. Tuttle. U. S. Bur.
Stand Tech Pa 37:1-17 '14; Same. J. Ind &
Eng Chem 6:994-8 D' 14
Quantitative method for the determination of
the adulteration in Chinese wood oil, J. C.
Brier. J. Ind & Eng Chem 7:953-7 N' 15

Oil as fuel. See Petroleum as fuel

Oil burners

il burners
Champion oil burner. diag Power 41:7 Ja 5 '15
Detail of open hearth oil burner, R. A. Bull.
diag Iron Tr R 57:626 S 30 '15
Fuel oil for locomotives. G. M. Bean. diags Ry
R 56:752-6 Je 5 '15; Same cond. Power 41:
900-1 Je 29 '15; Same cond. Ry Age (Mech
ed) 89:280-1 Je '15; Same cond. Ry Age 58:
1115-16 My 28 '15; Same cond. Sci Am 113:
92 Jl 31 '15

92 Jl 31 '15 Low-pressure oil burners at Steptoe, diags Eng & Min J 99:615 Ap 3 '15 Low-pressure oil-burning metallurgical fur-naces, il Met & Chem Eng 13:510-11 Ag '15 Petroleur as fuel under boilers and in fur-naces for heating, melting, and heat treat-ment of metals. W. N. Best, il diags Am Inst Min E Bul 104:1527-37 Ag '15; Discus-sion, 108:2420-2 D '15

Pressure oil burners. H. A. Everett. il Int Marine Eng 20:314-15 Jl '15

Rotary crude-oil burner, diag Power 41:815 Je

Sec also Acetylene burners

Oil circuit breakers. See Electric circuit breakers Oil coolers

S. & K. oil cooler. diag Power 41:564-5 Ap 27

Oil economizer

Emulsifying cylinder oil with steam. diags Power 42:745-6 N 30 '15

Oil engines. See Gas and oil engines

Oil filters

Il filters
Combination oil filter and oil refiner. il Elec
W 66:264 Jl 31 '15
Cream separator used as an oil filter. A. J.
Humphrey. il Mach 21:319 D '14
New oil filter by Richardson-Phenix co. il Iron
Tr R 56:1170 Je 10 '15

il filter and drier designed by the British Thomson-Houston company, of Rugby. Sci Am S 79:66 Ja 30 '15

Peterson power-plant oil filter, diags Iron Age 95:838-9 Ap 15 '15; Am Gas Light J 102:284-5 My 3 '15; Power 41:606-7 My 4 '15; Ry Age (Mech ed) 89:253-4 My '15; Ind Eng 15:75-7 Ag '15; Sci Am S 80:245 O 16 '15

Oil flow

Flow of oil fuel in pipes. Am Soc M E J 37:48 Ja '15

Oil gas. See Gas, Oil

Oil handling

Storage and handling of gasoline in the garage. H. T. Wade. il Sci Am 112:12-13 Ja 2 '15

Oil insulation. See Insulation

Oil lands

nited States mining statutes annotated. J. W. Thompson. U S Bur Mines Bui 94: pt 2, 1043-52 '15

Oil painting. See Painting

Oil pipe lines. See Petroleum pipe lines

Oil piping
Method of lifting oil for a gravity-feed system by use of condenser vacuum. A. Kuylenstjerna. diags Elec W 66:1149 N 20 '15

Tank ship construction. R. W. Morrell. Int Marine Eng 20:71-3 F '15

Oil properties. See Petroleum industry

Oil purification

Reubold electrolytic condensate purifier, diag Power 42:561 O 19 '15

Oil reclaimer

De La Vergne oil reclaimer, il diag Power 42: 336-7 8 7 15: Iron Age 36:1103-4 N 4 15

Oil separators

Make it easy" specialties, il Power 42:649 N 9 '15 il separation from water of condensation; abstract, M. Vahle, diags Am Soc M E J 37: 345-6 Je '15 il separation

343-5 Je 13 Oil separator failed to work. R. N. Robertson; R. McLaren. Power 41:452 Mr 30 '15 Reasons for an oil separator failing to work, T. W. Reynolds. diag Elec W 66:416 Ag 21

Removing oil from feed water; the deolizer. il Am Gas Light J 103:287 O 11 '15 Why is an oil separator? R. H. Johnston. diags Horseless Age 36:297-8 S 15 '15

Oil shales

Bituminous shales of Colorado, G. R. DeBeque, il Eng & Min J 99:773-4 My 1 '15

Oil ships. See Tank ships

Oil storage
Concrete-lined oil storage reservoirs in Callfornia; construction methods and cost data; abstract. E. D. Cole. diag Eng & Contr 44: 408-9 N 24 '15

408-9 N 24 '15
Fuel oil stations for extreme climatic conditions, plan Ry Age 58:475-6 Mr 12 '15
Oil-proof reservoirs of concrete, W; M, Kinney, Concrete Cem 6:251-2 My '15
Rebuilding a burned oil tank, C, P, Bowie, il
Eng N 74:9:6-7 N 18 '15

Storage and handling of gasoline. Sci Am 112: 256 Ap 17'15

356 Ap 17'15 Storage and handling of gasoline in the garage. H. T. Wade. il Sci Am 112:12-13 Ja 2'15

Oil switches. See Electric switches

Oil tanks. See Oil storage

Oil testing

malysis and valuation of motor fuels—14 methods for examining them; from German data. Automobile 33:205, 247-9+ Jl 29-Ag 5

Automobile lubrication, C. W. Stratford, il Sci Am S 79:392-3, 412-14 Je 19-26 '15; Same, Horseless Age 35:879-81; 36:16-19 Je 30-Jl 7

omparative exposure test of vehicles for paint, C. M. Chapman, Eng N 73:70-1 Ja 14 15 Comparative

Design of an absolute viscometer for engineering testing of oils, G. B. Upton. Sibley J 29:262-9 My '15

Device tests adhesiveness of California road oils, il Eng Rec 71;329 Mr 13 '15 Lubricating oil for Diesel engines and air compressors. H. Moore, Engineer 120:176 Ag

20 '15
Lubricating oil tests. R. C. Merchant. Colliery 35:615+ Je '15
Physical qualities of castor oil. P. G. McVetty. Automobile 33:500-1 S 16 '15
Report on switch and transformer oils. W. P. Digby. Inst E E J 53:146-56 Ja 1 '15; Abstract. Elec W 65:345-6 F 6 '15
Road oil test for loss on heating needs revision. N. Chivvis. diags Eng Rec 72:570-1 N 6 '15

Testing lubricating oils. A. H. Gill. Power 41:

Testing lubricating oils. A. H. Gill. Power 41; 522-3 Ap 13 '15

Testing oils for flotation process; abstracts.
J. Coutts. Met & Chem Eng 13:389-90 Je '15; Eng & Min J 99:1079-80 Je 19 '15

Theory of lubrication. L. Ubbelohde. Gen Elec R 18:1078-81 N '15

Value of clean bottles for sampling transformer oil. Elec W 66:589 S 11 '15

Von Kapff's oil testing machine; abstract. Am Soc M E J 37:412-13 J1 '15

Oil transportation. See Tank cars; Tank ships Oil wells. See Petroleum

Oils, Essential. See Essential oils

Oils and fats British India. U S Sp Cons Rep 72:376-92 '15 Chemical and physical properties of oils dis-tilled from the various parts of the plant acorus calamus, L. G. A. Russell. Am Chem Soc J 37:2387-94 O '15 Composition of the seeds of martynia Louisiana, E. H. S. Bailey and W. S. Long, J Ind & Eng Chem 7:867-8 O '15 Cooking fats in South America, U S Sp Cons Rep 67:1-15 '15

Rep 67:1-15 '15
Determination of unsaponifiable matter applicable to ether extracts, fats, oils and waxes.
J. B. Rather. J Ind & Eng Chem 7:34-5 Ja '15
Effect of free fatty acids upon the flash and fire points of animal fats and oils. A. Lowenstein and J. J. Vollertsen. J Ind & Eng Chem 7:850 O '15
Eucalyptus oil industry of California. P. W. Tompkins, J Ind & Eng Chem 7:995-7 N '15
Hydrogenation of oils and soft fats. Sci Am S 80:99 Ag 14 '15
Investigations on the oil of eucalyptus globus

Hydrogenation of onls and soft lats, Ser Am S 80:99 Ag 14 '15

Investigations on the oil of eucalyptus globulus of California, C: E. Burke and C: C. Scalione, il J Ind & Eng Chem 7:206-9 Mr '15

Kambara earth and its bleaching action on oils. S. Ueno. diags J Ind & Eng Chem 7: 596-600 Jl '15

Modern substitutes for butter. Sci Am S 80:27

Ji 10 15
Oils of the coniferae. IV—The leaf and twig
oils of digger pine, lodgepole pine, and red
fir. A. W. Schorger. J Ind & Eng Chem 7:246 Ja 15
Paint vehicles as protective agents against

Paint vehicles as protective agents against corrosion; with discussion. M. Toch. ii J Ind & Eng Chem 7:510-14 Je '15
Physical constants of gas oils and derived tars. W. F. Rittman and G. Egloff. J Ind & Eng Chem 7:481-4 Je '15
Rate of evaporation of ether from oils and its application in oil-ether colonic anesthesia. C: Baskerville. J Ind & Eng Chem 7: \$68-70 O '15
Specific gravity its 3-1

Specific gravity—its determination for tars, oils and pitches. J: M. Weiss. il J Ind & Eng Chem 7:21-4 Ja '15

Unsaponifiable matter in greases. E. J Ind & Eng Chem 7:217-18 Mr '15

See also Butter fat; Cottonseed oil; Creosote; Essential oils; Linseed oil; Lubrication and lubricants; Oil analysis; Petroleum

Okeechobee, Lake
Lake Okeechobee water level, F. C. Elliot.
Eng N 74:612-13 S 23 '15

Oklahoma

Industries and resources

Influence of the Cushing pool in the oil industry, R. H. Johnson and L. G. Huntley, Eng Soc W Pa 31:460-72; Discussion. 31:472-87 Jl '15

also Mines and mineral resources -

Oklahoma gas, electric & street railway association

h annual convention, Oklahoma City, May 12-13. Elec Ry J 45:983-5 My 22 '15

th annual convention, Oklahoma City, May 12-13. Elec W 65:1340 My 22 '15

Oleoresin Oleoresin of sand pine. A. W. Schorger. J Ind & Eng Chem 7:321-2 Ap '15

Omaha, Nebraska

Water supply

Rebuilding the Omaha water-intake cribs. G: T. Prince. il diags Eng N 74:342-4 Ag 19

Omens

Omens of war. Sci Am 113:3 Jl 3 '15 Omnibuses, Electric. See Electric buses

Omnibuses, Motor. See Motor buses

Omnibuses, Steam. See Motor buses, Steam

Onnes, Heike Kamerlingh, 1853-Award of the Franklin medal, J Fr Inst 180: 107-11 Jl '15

Dutch specialist in cold. por Sci Am 112:151+ F 13 '15

Ontario

also Mines and mineral resources -See Ontario

Ontario municipal railway 1500-volt direct-current electrification of the Ontario municipal railway. G. H. Hill. Gen Elec R 18:10-11 Ja '15

### Opelousas, Louisiana

Lighting

pelousas' municipal lighting plant. A. C. Jones. il Power 41:41-2 Ja 12'15 Opelousas'

Open and closed shops

Closed shop clauses in building contracts. W. Drew. Am Ind 15:11-12 Mr '15 Detroit's great growth due to its open shop policy. L. W. Moffett. Iron Tr R 57:143-7 Jl

Federal industrial relations commission report. W. Drew. Am Ind 15:15-17 Ja '15

Open hearth process
Air and steam as atomizing agents. R. A. Bull.
diags Iron Tr R. 57:626-9 S 30 '15; Same
(Tests in atomizing fuel oil with steam and
air). Foundry 43:424-7 O '15; Excerpts. Iron
Age 96:1049-50 N 4 '15

Areagrams of open-hearth furnace flues. A. R. Mitchell. Iron Age 95:607-8 Mr 18 '15 Checker design for open hearths. W. A. Janssen. Iron Tr R 57:624-5 S 30 '15; Same. Foundry 43:413-15 O '15

New end construction for open-hearth fur-naces, diag Iron Age 96:244 Jl 29 '15

Open hearth versus the electric furnace in the manufacture of commercial steels. S. Cor-nell. Met & Chem Eng 13:630-1 S 15 '15

Waste-heat boilers in steel plants; abstracts. C. J. Bacon. diags Iron Age 95:1349-52 Je 17 '15: Iron Tr R 56:1123-4 Je 3 '15; Power 42: 27-8 Jl 6 '15

Open shop. See Open and closed shop

Early history of opium. Sci Am S 80:20 Jl 10

History of opium. D: I. Macht. Sci Am S 79: 350-2 My 29 '15

Optical illusions

Seeing under water, il diags Sci Am S 80:97+ Ag 14 '15

Optical instruments

Nee also Kaleidoscope; Lenses; Periscope; Stereoscopic telemeter; Telescopes

Optical rotation

Comparison of the optical rotatory powers of the alpha and beta forms of certain acety-lated derivatives of glucose. C. S. Hudson and J. K. Dale. Am Chem Soc J 37:1264-70 My '15

Optical rotatory power and chemical constitution. L. G. Wesson. Am Chem Soc J 36: 2522-32 D '14

Optics Visibility, C. C. Paterson and B. P. Dudding.
Illum Engr 8:210-16; Discussion. 8:216-26
My '15

See also Light

Optics, Physical

ptics, Physical Absorption, reflection, and dispersion con-stants of quartz. W. W. Coblentz. U S Bur Stand Bul 11:471-81 My 10 '15 Optical properties of diffusing media. Illum Eng Soc 10:353-402 no 5 '15

Mechanical eye bringing sight to the blind; a description of the crystal phonopticon, L. E. Dodd. il Sci Am 113:138+ Ag 14'15

Optophone and musical pitch. E. H. Hawley. Sci Am 111:523 D 26 '14

Phonoptikon and the optophone. E. E. Fournier d'Albe. Sci Am 113:467 N 27 '15

Type-reading optophone. E. E. Fournier d' Albe. diag Sci Am S 78:371 D 12 '14

Orcinolphthaleins

Orcinolphthaleins, the orcinoltetrachlorophtha-leins, and some of their derivatives. W. R. Orndorff and E. R. Allen. Am Chem Soc J 37:1201-58 My '15

Ore bins Steel vs. timber ore bins. P. E. Barbour. diags Eng & Min J 99:195-6 Ja 23 '15

Ore chute. See Mine timbering Ore cleaning. See Ore treatment Ore deposits

de deposits Ancient sedimentary iron ores of British In-dia. C. M. Weld. maps Econ Geol 10:435-52

Certain mineral occurrences in the Certain mineral occurrences in the Wormington mine, Sudbury, Ontario, and their significance, T. L. Walker. il map Econ Geol 10:536-42 S '15 Copper deposits in the Red Beds of southwestern Oklahoma. A. E. Fath. il Econ Geol

10:140-50 F

10:140-50 F '15
Copper deposits of San Cristobal, Santo Domingo, T: F. Donnelly, bibliog il Am Inst Min E Bul 104:1759-68 Ag '15; Discussion. 108:2473-4 D '15
Disseminated copper ores of Bingham Canyon, Utah. J. J. Beeson. il diags Am Inst Min E Bul 107:2191-236 N '15
Economic geology, A. Knopf. Eng & Min J 99: 102-4 12 9 '15-15

Economic geology. A. Knopf. Eng & Min J 99: 102-4 Ja 9 '15

Experiments in the enrichment of silver ores. L: G. Ravicz, Econ Geol 10:368-89 Je '15

Formation and distribution of bog iron-ore deposits. C. L. Dake. Am Inst Min E Bul 103:1423-36 Jl '15; Eng & Min J 100:74-5 Jl 10 '15; Excerpts. Iron Tr R 57:486 S 9 '15; Discussion. Am Inst Min E Bul 108:2475-6

Formation of the oxidized ores of zinc from the sulphide. Y. T. Wang, il Am Inst Min E Bul 105:1959-2012 S '15 Geological anatomy of a Tennessee zinc mine. F. L. Nason. diags Eng & Min J 100:259-62 Ag 14 '15

F. L. Nason. diags Eng & Min J 100:239-62
Ag 14 '15
Geology and ore deposits of Red Cliff, Colorado.
A. H. Means. il Econ Geol 10:1-27 Ja '15
Geology of Juneau district, F: B. Hyder. Eng & Min J 99:901-2 My 22 '15
Geology of the iron-ore deposits in and near Daiquiri, Cuba. J. F. Kemp. il diags map Am Inst Min E Bul 105:1801-36 S '15; Discussion. 108:2472 D '15
Geology of the ore deposits of the Tintic mining district. G. W. Crane. Am Inst Min E Bul 106:2147-60 O '15; Same cond. Eng & Min J 100:753-7 N 6 '15
Goldfield and its present boom. H. C. Cutler. il Eng & Min J 99:221-4 Ja 30 '15
Iron deposits of Daiquiri, Cuba. W. Lindgren and C. P. Ross. bibliog il Am Inst Min E Bul 106:2171-90 O '15
Is the Boulder batholith a laccolith? discussion of paper by A. C. Lawson. A. Knopf. Econ Geol 9:396-402 Je '14
Main mineral zone of the Santa Eulalia district, Chihuahua. B. Prescott, diag map Am Inst Min E Bul 98:155-98 F '15
Mayari iron-ore deposits, Cuba. J. F. Kemp. il diags Am Inst Min E Bul 98:129-54; 103: 1461-2 F, Jl '15
Observations on contact metamorphic ore deposits. B. Prescott. diags Econ Geol 10:55-69 Ja '15
Orebodies of the Mesabi range. J. F. Wolff. il map Eng & Min J 100:89-94, 135-9, 178-85, 118-

69 Ja '15
Orebodies of the Mesabi range. J. F. Wolff.
il map Eng & Min J 100:89-94, 135-9, 178-85,
219-24 Jl 17-Ag 7 '15
Ores of Gilpin county, Colorado. E. S. Bastin.
il Econ Geol 10:262-91 Ap '15
Origin of certain ore-deposits. J. E. Spurr.
Econ Geol 10:101-22 F '15
Origin of certain ore-deposits. L. V. Pirsson.
Econ Geol 10:180-6 F '15

Oriskany iron ores of Virginia. C. M. Weld. maps Econ Geol 10:399-421 Jl '15

Pocket deposits of the Klamath mountains, California. H: G. Ferguson. il maps Econ Geol 10:241-61 Ap '15

Problems in iron ore geology in Sweden and in America. P. Geijer. il Econ Geol 10:299-329 Je '15

Processes of mineralization and enrichment in the Tintic mining district. W. Lindgren. 2 pls Econ Geol 10:225-40 Ap '15

Quartz veins in lamprophyre intrusions. J. F. McLennan. Eng & Min J 99:11-13 Ja 2 '15

Rate of reduction of acidity of descending waters by certain ore and gangue minerals and its bearing upon secondary sulphide enrichment. G. S. Nishihara. il Econ Geol 9:743-57 D '14

Relation of ore deposits to different types of intrusive bodies in Utah. B. S. Butler, map Econ Geol 10:101-22 F '15

Ore deposits—Continued
Structure of the Cuyuna iron-ore district of
Minnesota. C: A. Cheney, jr. map Eng &
Min J 99:1113-15 Je 26 '15

Temperatures that obtain in zones of chalcocitization. W. H. Emmons. Econ Geol 10:151-

60 F

60 F 15 inc deposits of eastern Tennessee, F, L. Nason, Eng & Min J 99:734-6 Ap 24 '15 See also Boulder batholith; Copper ores; Geology; Iron ores; Jamesonite; Mines and mineral resources

Ore dressing. See Ore treatment

Ore handling

e handling
Application of electricity to the ore handling
industry, C. D. Gilpin, diags Am Inst E E
Pro 34:397-415 Mr '15; Abstract, Elec W 65:
996-7 Ap 17 '15; Discussion, Am Inst E E
Pro 34:3063-7 D '15

Pro 34:3063-7 D '15

Design, construction, operation and cost of a 2,594-ft. steel stocking trestle at the Negaunee mine, Negaunee, Mich. S. R. Elliott. il Eng & Contr 44:171-3 S 1 '15

Direct-current motors for coal and ore bridges. R. H. McLain. il Am Inst E E Pro 33:1009-20 Je '14; Discussion. 33:1887-8 D '14

Hamill belt-driven ore feeder. il Eng & Min J 100:805 N 13 '15

Influence of discharging appliances on the design of large ore carriers. J: Reid. diag Engineer 119:300-1 Mr 26 '15

New ore unloading plant at Huron. il Int Marine Eng 20:65-6 F '15

Ore unloaders at Philadelphia. il Iron Tr R 56:1009-10 My 20 '15

Permanent stockpile trestle of wood. O. Gustafson. il diags Eng & Min J 98:1003-4 D 5 '14

Simple holder for ore sacks diag Eng & Min

Simple holder for ore sacks, diag Eng & Min J 100:840 N 20 '15

Ore pulp
Barth slide rule for pulp measurement. C. G.
Barth, ir. il Eng & Min J 100:228 Ag 7 '15
Filtration of slime. L. D. Mills. Met & Chem
Eng 13:724 O 15 '15
New diaphragm pump. il Met & Chem Eng 13:
455-6 Jl '15
Note on the settling of slimes. A. J. Clark.
Eng & Min J 99:412 F 27 '15
Pulp constants, with tables to facilitate tonnage calculations for pulps of all usual solution and dry slimes specific gravities. G. H.
Clevenger, H. W. Young and T. N. Turner.
Eng & Min J 98:1079-94 D 19 '14

Eng & Min J 98:1079-94 D 19 '14

Ore sampling
landill sampling machine. J. O. Bardill. il
diag Eng & Min J 100:303-4 N 13 '15

Large-scale sampling. S. J. Jennings. Eng &
Min J 98:1138 D 26 '14

Mechanical ore sampler. J. H. Taylor. diags
Eng & Min J 100:229 Ag 7 '15

New method of making sieve tests. R. H. Bassett. Iron Tr R 57:230+ Jl 29 '15

New sampling plant at Hamburg. il diags Eng
& Min J 100:140-1 Jl 24 '15

Sample catcher for backs. A. L. Oke. il Eng &
Min J 98:1096-7 D 19 '14

Sampling of churn-drill prospect holes. F: G.
Moses. diags Eng & Min J 100:301-4 Ag 21
'15

Ore transportation

Ore transportation

For a 40-cent iron-ore rate. Iron Age 95:194 Ja 21'15

Ja 21 '15 Influence of discharging appliances on the design of large ore carriers, J: Reid, diag Engineer 119:300-1 Mr 26 '15 Shipping ore by parcel post. Eng & Min J 100:348 Ag 28 '15

See also Motor trucks in ore haulage

Ore treatment

Broken Hill milling practice. Eng & Min J 100:151-3 Jl 24 '15 Chilean nitrate industry. M. R. Lamb. il Eng & Min J 99:811-15 My 8 '15 Chloridizing blast roasting and leaching. G. A. Keep. il diag Eng & Min J 99:265-9, 315-22 F 6-13 '15

Chloridizing ores at Silver City, Utah. il diag Met & Chem Eng 12:757-9 D '14

Cleaning carbonate ores at Highland, Wis. W. F. Boericke. plan Eng & Min J 99:906-7 My 22 '15

Combined cyanide and other processes. H. A. Megraw. Eng & Min J 98:1007-9, 1127-9 D 5, 26 '14

Concentrating plant of the Moose Mountain, Ltd. B. B. Hood, il diag Eng & Min J 99: 973-6 Je 5 '15

Ltd. B. B. Hood, il diag Eng & Min J 99: 973-6 Je 5 '15

Concentration by crushing and screening at the Vindicator consolidated mill. il Met & Chem Eng 13:142-3 Mr '15

Concentration by the Goltra process: beneficiation of brown iron ores by means of a current of hot air and properly located screens. W: B. Phillips. Iron Age 94:1148-50 N 12
'14; Abstract. Eng M 48:582-5 Ja '15

Concentrator of the Timber Butte milling co., Butte, Mont. T. Simons, diags map Am Inst Min E Bul 102:1295-1316 Je '15; Abstract. Met & Chem Eng 13:447-9 Jl '15

Development of ore concentration. H: A, Marvin. il Eng M 49:218-30 My '15

Electricity in an ore-treating plant. il Elec R & W Elec'n 66:481-4 Mr 13 '15

Experiments on the flow of sand and water through spigots. R. H. Richards and B. Dudley, jr. diags Am Inst Min E Bul 97:67-72 Ja '15; Same cond. Met & Chem Eng 13:120 F '15.

'15; Same cond. Met & Chem Eng 13:120 F
'15'
Handling concentrates at the South Utah
plant. T: H. Tulloch. diags Eng & Min J 99:
698-9 Ap 17' 15
Improvements at the reduction works of the
Anaconda company. F: Laist. Eng & Min
J 99:418-19 F 27' 15
Is there a complex-ore problem? W. Motherwell. Met & Chem Eng 13:8-9 Ja' 15
Magnetic-concentration mill at Mt. Hope,
N. J. S: Shapira. il diags Eng & Min J
99:559-65 Mr 27' 15
Mears-Wilfley tailings mill, W. C. Prosser.
il Eng & Min J 99:607-8 Ap 3' 15
Metallurgical practice in the Porcupine district. N. Cunningham. Am Inst Min E Bul
99:601-8 Mr '15; Abstract. Met & Chem
Eng 13:187-8 Mr '15; Discussion, Am Inst
Min E Bul 101:1141-2 My '15
Metallurgical treatment of the low-grade and
complex ores of Utah. D. A. Lyon, R. H.
Bradford, S. S. Arentz, O. C. Ralston, and
C. L. Larson. U S Bur Mines Tech Pa 90:1-

Method of treating carnotite ores. Eng & Min J 99:864 My 15'15 Mining and milling of lead and zinc ores in the Wisconsin district, Wisconsin. C. A. Wright, il plan U S Bur Mines Tech Pa 95: 20-33'15

20-33 '15

Mining and reduction of quicksilver ore at the Oceanic mine, Cambria, Cal. C. A. Heberlein. diags Am Inst Min E Bul 98:497-504 F '15; Discussion. 101:1139-41 My '15

Notes on Homestake metallurgy; stamp miling; analysis of lost time; cost. A. J. Clark. il Am Inst Min E Bul 103:1381-1400 Jl '15; Abstract. Met & Chem Eng 13:764-6 O 15 '15; Discussion. Am Inst Min E Bul 108:2453-4 D '15

Ore dressing at Clausthal. E. M. Heriot, diags.

4 D '15
Ore dressing at Clausthal, E. M. Heriot, diags
Eng & Min J 100:425-9 S 11 '15
Rotary kilns for desulphurization and agglomeration, S: E. Doak, Am Inst Min E Bul 105:
2061-6 S '15; Same, Iron Age 96:574-6 S 9
'15; Same, Iron Tr R 57:1178-9+ D 16 '15;
Same cond, Eng & Min J 100:601-2 O 9 '15
Shaft-rockhouse practice in the copper country, L. H. Goodwin, il diags Eng & Min J
99:1061-6, 1107-10; 100:7-12, 53-7 Je 19-Jl 10
'15

melting methods at Magistral, Durango, Mex. R. W. Bissell. Sch Mines Q 36:22-9 N '14 Smelting

Vost process of recovering rare elements. Eng & Min J 100:106-7 Jl 17 '15

Wet ores in charcoal blast furnaces. R. H. Lee. Met & Chem Eng 13:882 D 1 '15

Lee. Met & Chem Eng 18:882 D 1 19

\*\*Rec also Concentrating Coupler metallurgy; Crushing; Crushing machinery; Cyanide process; Electrometallurgy; Electrostatic separation of ores; Filters and filtration (metallurgy); Floation process; Gold milling; Hardinge mill; Hydrometallurgy; Magnetic separation of ores; Metallurgical patents; Metallurgical plants; Metallurgical patents; Tube milling; Tailings; Trent agitators; Tube milling

Ore treatment-Continued

Cost

Milling at the Tonopah Belmont plant. Eng & Min J 99:1082 Je 19 '15 Milling costs at the Goldfield consolidated plant. Eng & Min J 99:1036-7 Je 12 '15

Milling costs in Alaska. Eng & Min J 100:

Oregon

Sec also Mines and mineral resources-Oregon

Oregon society of engineers Report for the year 1914, O. E. Stanley, Assn Eng Soc J 54:123-6 Mr '15

See also Assaying; Iron ores; Metallurgy; Metals; Mines and mineral resources; Ore deposits; Ore treatment

Organic chemistry. See Chemistry, Organic

Organization in engineering
Organization for bridge work by day labor,
St. Louis. Eng. N. 74:605 S. 23 '15
See also Highway administration

Organization in industry
Address to the British association engineering section, H. S. Hele-Shaw. Engineer 120: 255-7 S 10 '15

Ing section. H. S. Hele's and Section. H. S. Hele's and blue Monday; true story, showing the relation of the engine house organization to engine failures. H. D. Wolcomb. Ry Age (Mech ed) 89:533-6 O'15 Central-station sales department organization and work. F. D. Beardslee. Elec R. & W. Elec'n 65:1073-9 D 5'14

Human element. J. Hartness. Iron Age 94: 1297 D 3'14; Same. Metal Work 82:780 D 11'14; Same. Am Gas Light J 102:17-18 Ja 11'15; Same. Am Gas Light J 102:17-18 Ja 11'15; Same. Am Soc M E J 37:2-3 Ja '15 Human factors in engineering practice. J: Calder. Stevens Ind 32:193-206 JI'15 Individual in modern management. F. B. Gilbreth and L. M. Gilbreth. Iron Age 96:802-4 O 7'15
Organization at Delray. N. G. Reinicker. Pow-

O 7 15 Organization at Delray, N. G. Reinicker, Pow-er 42:343-4 S 7 '15 Railway repair shop organization. H: Gard-ner, Ry Age (Mech ed) 89:536-8 O '15 Scientific management for the factory of mod-erate size, D. T. Farnham, Eng M 50:46-51

Ultimate type of management. J Deventer, Eng M 49:394-401 Je

See also Factory management; Office man-Railroads-Management; tific management

Oriental consolidated mining company, Chosen, Asia

Oriental consolidated; report for year e July 31, 1914. Eng & Min J 99:197 Ja 23

Orientation
Relation between spectral color and stimulation in the lower organisms. S. O. Mast.
J. Fr. Inst. 18 (617-19) N. 115

Ornament. See Decoration and ornament

Osage orange

Important constituents in the fruit of the osage orange, J. S. McHargue, J Ind & Eng Chem 7:612-13 Jl '15

Oscillators

scillators
Electrical porcelain. I. Testing with a high-frequency oscillator. II. The problematical points of manufacture. III. Experiences and experimental investigations. E. E. E. Creighton. il Am Inst E E Pro 34:753-841 My '15; Discussion. 34:2622-45 N '15
High-frequency oscillator for porcelain-insulator, testing, il diag Elec R & W Elec'n 66: 880-1 My 8 '15; Elec W 65:1207 My 8 '15; Ry R 56:668 My 15 '15

Oscillating circuit-controller for railway signal circuits. il Elec R & W Elec'n 65:1193-4 D 19

roduction of damped oscillations, L. G Heath, diags Gen Elec R 18:1110-17 D '15 See also Audion; Fessenden oscillator

Oscillograph Cathode ray tube and its application. M. Tressler. diag Gen Elec R 18:816-20 Ag Investigation of dielectric losses with the cathode ray tube. J: P. Minton, il Am Inst E E Pro 34:1115-65 Je '15

Osiers Basket willow culture. G: N. Lamb. il map U S Agric Farmers' Bul 622:1-34 '14

Osmosis

Electrolytic endosmose. H. G. Byers and C. H. Walter, diags Am Chem Soc J 36;2284-91 N

Osmotic pressure
Osmotic pressure and concentration in solutions of electrolytes, and the calculation of the degree of ionization. S. J. Bates. Am
Chem Soc J 37:1421-45 Je '15

Ostend, Belgium

Sewerage

Sewage purifying plant at Ostend. Sci Am 112: 50 Ja 9 '15

Otis & Clark, architects
Examples of the work of Otis & Clark. 1
Croly. il plans Arch Rec 37:385-409 My '15 Ottawa, Ontario

Water supply

Another water-supply project for Ottawa. J. A. Macdonald. Eng N 73:43 Ja 7 '15 Water filtration hold-up at Ottawa, Ont. Eng N 72:1167 D 10 '14

Outdoor life

Forests and recreation. W. H. Miller. il Am For 21:543-9 Ap '15

Ovens. See Coke ovens; Electric ovens; Stoves

Overhead expense

Apportioning indirect production expense.

A. M. Eurroughs. Metal Work 83:284-6,
316-18 F 19-26 '15

Appraisal of overhead costs. H. P. Gillette.
Elec W 66:41-2 J1 3 '15

Cost of doing business. G: W. Hill. Dom Eng
71:306-7 Je 12 '15
Distripting overhead expense. N: T. Ficker.

71:306-7 Je 12 '15
Distributing overhead expense. N: T. Ficker.
Eng M 49:553-9, 690-7, 862-71; 50:58-64, 254-61, 390-400 Jl-D '15
Doing business on low overhead expense;
W. B. Perry electric company, of Brooklyn.
Elec W 65:544-6 F 27 '15
Fair overhead charges allowed; Bronx gas and electric company. Elec Ry J 46:831 O 16
'15

Finding costs in the steel foundry. G. Muntz. Iron Tr R 57:482-4 S 9 '15
Merchant plumber's overhead expense. J: J. Foy. Metal Work 83:251-3 F 12 '15
Overburdening the overhead expense. H. Whitehead. Dom Eng 72:317-18 S 11 '15
Overhead charges in valuation. R: H. Tingley. Ry Age 58:1247-8 Je 11 '15
Overhead expense per man per hour. W. A. Fink; R. H. Pflug-Felder. Dom Eng 71:335-6 Je 19 '15
Overhead expenses in the main works of the

Overhead expenses in the main works of the Westinghouse electric & manufacturing company. G. D. Piper. Elec Ry J 44:1339-40 D 19

Relation between production and costs. H. L. Gantt. Am Soc M E J 37:466-8 Ag '15; Same. Am Gas Light J 103:54-5 Jl 26 '15; Same. Iron Age 96:16-18 Jl 1 '15; Same. Iron Tr R 57:267-8+ Ag ·5 '15; Same. Mach 21:1000-2 Ag '15; Same. Textile World 49:510-13 Ag '15; Discussion. Am Soc M E J 37:468-75 Ag '15 Sheet metal contractor's overhead expense. Metal Work 83:925-6 Je 25 '15 Valuation of water works properties; the appraisal of overhead costs. H. P. Gillette. Eng & Contr 44:14-18 Jl 7 '15 What constitutes overhead. E. H. Fish. Eng M 49:488-97 Jl '15

49:488-97 Jl '15 What is cost of material and labor? W. A. Fink. Dom Eng 72:105-6 Jl 24 '15

Oxidase

Retention of activity by urease and by oxi-dase after exposure to the temperature of liquid air. J. S: Hepburn and C: B. Baz-zoni. bibliog J Fr Inst 180:603-5 N '15

Electrochemical oxidation of hydrazine sulfate and ammonium hydroxide. J. W. Turrenting and J. M. Olin. Am Chem Soc J 37:1114-22 My '15 Oxidation

Oxidation Continued
Oxidation of sulfides with potassium iodate.
R. S. Dean, Am Chem Soc J 37:1134-7 My
'15

Oxidation potential

Measurement of oxidation potentials at mer-cury electrodes: the stannic-stannous po-tential, G: S. Forbes and E: P. Bartlett, Vm Chem See J 36:2030-40 O 14

Oxonium salts

Organic oxonium compounds: dimethylpyrone-hydrochloride, H. N. K. Rördam, Am Chem Soc J 37:557-67 Mr '15

Oxyacetylene flame

Acetylene welding of gas pipe. G: H. Manlove. il Iron Tr R 56:272-3 F 4 '15 Autogenous pipe welding. il Iron Age 95:296-7

Autogenous soldering or welding of aluminum. il Mach 21:369-71 Ja '15 Cutting down a steel stack, il Power 41:888 Je 29 '15

Je 29 '15
Cutting up a bridge with the oxyhydrogen torch, il Sci Am 112:71 Ja 16 '15
Data on oxy-acetylene welding and cutting equipment. Eng & Contr 43:513-4 Je 16 '15
Dissolved and self-generated acetylene, M. K. Dunham, Iron Age 96:351-3 Ag 12 '15
Flashback in the welding torch, M. K. Dunham, diag Mach 22:50-1 S '15
Flashback in the welding torch, S. W. Miller, Mach 22:233-4 N '15
Case-weld rail honding. L. R. Brown, il Fles.

Flashback in the welding torch. S. W. Miller. Mach 22:233-4 N '15
Gas-weld rail bonding. J. R. Brown. il Elec Ry J 46:1087-9 N 27 '15
Gas welding for pipe lines. J. F. Springer. il Munic J 38:254-6 F 25 '15
High temperature flames in metal working. H. R. Swartley, jr. Iron Age 96:1122 N 11 '15
How time and money were saved by welding; oxy-acetylene process saved 13 days. il Foundry 43:235 Je '15
Imperial oxy-acetylene equipment. il Foundry 43:168 Ap '15; Elec Ry J 45:517 Mr 13 '15; Ry Age (Mech ed) 89:197 Ap '15
Oxy-acetylene process for boiler work; report of committee of Master boiler makers' association. Ry Age (Mech ed) 89:309-12 Je '15; Same cond. Ry Age 58:1165-6 Je 4 '15
Oxy-acetylene process of welding. H: Cave. il diags Am Soc M E J 36:208-14 Je '14; Same cond. Eng M 47:750-2 Ag '14; Same cond. Eng M 47:750-2 Ag '14; Same cond. Eng & Contr 42:199-200 Ag 26 '14
Oxy-acetylene welding. A. H. Waychoff. diags Sci Am 8 79:132 F 27' '15

Oxy-acetylene welding and cutting equipment. S. W. Miller, il diags Mach 22:85-99

Oxyacetylene

Oxyacetylene welding at Great Falls, Mont, diags Eng & Min J 99:534 Mr 20 '15 Oxy-acetylene welding eliminates joints in gas mains; with cost figures. Il Eng Rec 71:182 F

mans; with cost figures. It might rec 17.102 r 6 '15

Oxyacetylene welding in mining, il diag Eng & Min J 99:393-7 F 27 '15

Oxyacetylene welding in pipe work. W. L. Roueche, il Power 41:808-11 Je 15 '15

Oxy-acetylene welding; International railway general foremen's association discussion. Ry Age (Mech ed) 89:425-6 Ag '15; Same cond. Ry Age 59:157 Jl 23 '15

Pipe welding at Panama Pacific exposition, il Metal Work 84:237-8 Ag 20 '15; Portable welding outfit for metallurgical works, il Met & Chem Eng 13:194 Mr '15

Practice of the oxy-acetylene welding process. S. W. Miller, il Mach 22:106-17, 215-19 O-N '15

Safety in oxy-acetylene welding. Eng M 49:596 Jl '15

Strength of welds made by the acetylene proc-

Strength of welds made by the acetylene process; abstracts. A. Campion and W. C. Gray, Ind Eng 14:415-16 O '14; Am Soc M E J 37: 355 Je '15 355 Je 15 Welding broken machine parts. il Power 42: 687-8 N 16 15

Welding copper and copper alloys by acetylene methods. J. F. Springer, Ry Age (Mech ed) 89:367-9 Jl '15

Welding defective cores in paper mill by the Prest-O-Lite process. il Met & Chem Eng 13:770 O 15'15

Welding the joints of steel gas mains, il Eng N 73:233-4 F 4 '15

Why acetylene is the combustible gas used for autogenous welding. M. K. Dunham. Mach 21:1017-18 Ag '15

Oxy-acetylene generators

Safe and unsafe oxy-acetylene generators. A. C. Morrison. Sci Am S 79:371 Je 12 '15

Determination of gases dissolved in waters and effluents. A. A. Swanson and G. A. Hulett. diags Am Chem Soc J 37:2490-500 N '15 Effect of oxygen on steel quality. J. A. Pickard and F. M. Potter. Iron Tr R 57:136-7+ Jl 15

and all 7. M. Fotter. Iron Tr R 57:136-7+
Il 15-15
Electrolytic production of oxygen and hydrogen—a typical plant. il Elec R & W Elec'n
66:1170-1 Je 19 '15
Free energy of oxygen, hydrogen, and the
oxides of hydrogen. G. N. Lewis and M.
Randall. Am Chem Soc J 36:1969-93 O '14
Oxy-acetylene welding and cutting equipment; manufacture of oxygen. S. W. Miller.
diags Mach 22:88-92 O '15
Plumboxan process for producing oxygen and
nitrogen from atmospheric air: abstract.
G. Kassner. Am Soc M E J 37:119 F '15
Possible applications of oxygen in metallurgy.
J. E. Johnson, jr. Met & Chem Eng 13:483-4
Ag '15

See also Oxidation

Oxynitrilase

Enzymes: the synthetic and hydrolytic oxynitrilase. V. K. Krieble. Am Chem Soc J 37: 2305-13 S '15

See also Pearl fisheries

Ozonators

Ozone apparatus as a business proposition. Elec R & W Elec'n 66:33-4 Ja 2 '15

Ozone

Zone
Air ozonation. M. W. Franklin. J Ind & Eng
Chem 6:850-5 O '14; Same; with discussion.
Am Soc Heat & V E 20:337-64 '14; Excerpts.
Heat & Ven 11:28-34 O '14; Metal Work 83:
722-3 My 21 '15 Heat & 722-3 M

Heat & Ven 11:28-34 O '14; Metal Work 83: 722-3 My 21 '15
Experiment with ozone as an adjunct to artificial ventilation. A. M. Feldman. Heat & Ven 12:35-6 Mr '15
Formation of ozone in the upper atmosphere. J. N. Pring. Sci Am S 79:286-7, 303 My 1-8

Ozone—an aid to factory ventilation. V. D. Greene. diag Eng M 49:517-25 Jl '15
Ozone and its applications. M. W. Franklin. Am Soc Heat & V E 19:128-40 '13
Ozone in ventilation. J. C. Olsen and W: H. Ulrich. Sci Am S 79:34-5 Ja 16 '15
Ozone treatment for drinking water. il Engineer 120:371 O 15 '15

Pacific coast

Panama canal and the ports of the Pacific. A. J. Quigley. il maps Eng M 48:493-7, 641-57, 808-26; 49:1-17 Ja-Ap '15

Pacific coast claim agents' association
7th annual meeting, San Francisco, June 2426; abstracts of papers. Elec Ry J 46:8-12
Jl 3 '15

Pacific electric railway

acific electric railway
All-steel passenger cars for the Pacific electric railway. F. F. Small, il diags Elec Ry
J 46:488-92 S 18 '15
Businesslike methods in handling freight by
electric railroads. J. McMillan. il Elec Ry
J 46:482-7 S 18 '15
Electric railway paradise. P. Shoup. il map
Elec Ry J 46:475-80 S 18 '15
Operation of the Pacific electric railway, il
map Ry Age 59:225-9 Ag 6 '15
acific gas & electric cas

Pacific gas & electric co.
Financial development and physical growth.
Elec W 65:1669-70 Je 26 15
Interconnected systems serving San Francisco;

details of the generating equipments and transmitting circuits tied in with the larger

Pacific gas & electric co.—Continued
system of the Pacific gas & electric company, which covers half of California, il
diags map Elec W 65:1356-82 My 29 '15
9th annual report. Elec W 66:427-8 Ag 21 '15
Pacific gas & electric company valuation
methods. Elec W 65:569-70 F 27 '15

Pacific highway
Interstate bridge over the Columbia river,
Portland, Ore. E. E. Howard. diags Eng N
73:1218-21 Je 24 '15
Pacific highway interstate bridge over the
Columbia river and its approaches between
Vancouver, Wash., and Portland, Ore. E. E.
Howard. diags Eng & Contr 43:540-3 Je 16

Special pier and floor design feature Pacific ing., why interstate bridge, diags Eng Rec 72:18-20 Jl 3 '15

Packing

Buhne fibrous babbitt packing, il Power 42:

Experiences in packing valves. Eng & Contr

Metallic packing substituted for packing State of State o

Sullivan piston and valve stem packing. il Ry Age (Mech ed) 89:596-7 N '15; Same. Ry Age 59:1019 N 26 '15

See also Packing rings

Packing for shipment

g or South America. Eng M 49:754-5

Packing of machinery, etc., for shipment abroad. H. T. Durant. Eng & Min J 99:205

Time waste in handling malleable fittings; use of cardboard shipping cartons. W: J. Wooley. Metal Work 84:192-3 Ag 6 '15

Packing house products
Contributions of the chemist to the packing
house products industry, A. Lowenstein, J
Ind & Eng Chem 7:942-4 N '15

Packing houses
Electricity in packing plants. il Elec R & W
Elec'n 66:145-8 Ja 23 '15

Packing machine Electromagnetic nail packing machine, il Iron Age 95:900-1 Ap 22 '15

Packing rings
Chuck for finishing air pump packing rings.
F. R. Stewart, diags Ry Age (Mech ed) 89:
589 N '15
Piston valve packing rings. W. F. Lauer,
diags Ry Age (Mech ed) 89:583 N '15

Pageants

Lighting

Lighting the pageant of Lexington. L. C. Porter. il plan Elec W 66:209-10 Jl 24'15

Paige patent bill. See Patent laws

Painesville, Ohio

Water supply

Small waterworks revamped under service. G. W. Knight and R. F. MacDowell, plan Eng Rec 72:287-8 S 4 '15

Paint

aint
Composition of paint vapors. C. A. Klein. J
Ind & Eng Chem 7:99-102 F '15
Contributions of the chemist to the paint and
varnish industry. M. Toch. J Ind & Eng
Chem 7:998 N '15
Corrosion of iron. L. C. Wilson. Eng M 49:
58-66, 202-10 Ap-My '15
Data on prepared paints for metal surfaces.
H: A. Gardner. Eng & Contr 44:346-7 N 3 '15
Doing without Europe. Sci Am 112:223 Mr 6
'15

Formula for paint for use with spraying machines. A. H. Sabin, il Eng N 73:40-1 Ja 7 '15
Insulation of underground piping. Elec R & W Elec'n 67:194 Jl 31 '15
Master car and locomotive painters' 46th convention. Ry Age 59:505-8 S 24 '15
Master painters' 46th annual meeting. Ry Age (Mech ed) 89:539-42 O '15

Mineral paints, J. M. Hill. Metal Work 84:

243 Ag 20 '15
Paint a product of science and civilization.
G. B. Heckel. Met & Chem Eng 13:806-11 N

G. B. Heckel. Met & Chem Eng 13:806-11 N. 1'15
Paint for engineering purposes. E. N. Percy.
Power 41:234-5 F 16'15
Paint protection of the Panama canal lockgates. H; Goldmark. Eng N 72:1227 D 17'14
Paint vehicles as protective agents against
corrosion; with discussion. M. Toch. il J
Ind & Eng Chem 7:510-14 Je'15
Painting defects; their causes and prevention.
G. W. Thompson. il J Ind & Eng Chem 7:13645 F'15; Excerpts. Ry Age 57:1138-41 D 18'
14; Excerpts. Eng N 73:876-8 My 6'15
Paints for steel structures. Iron Tr R 56:10623 My 27'15
Paints to prevent electrolysis in concrete
structures. H; A. Gardner. il J Fr Inst 179:
313-36 Mr'15; Same. J Ind & Eng Chem
7:504-10 Je'15; Same cond. Iron Tr R 57:
139-40+ Jl 15'15; Abstracts. Eng N 73:136-7
Ja 21'15; Eng Rec 71:465-6 Ap 10'15; Am
Soc M E J 37:297 My'15; Concrete Cem
6:210 Je'15.
Paints used in Havre de Grace bridge tests.
Ry Age 59:67 Jl 9'15
Paints which resist darkening by gases, soot,
etc. H: A. Gardner. Eng N 73:407 F 25'15;
Same. Ind Eng 15:79-80 Ag'15
Prepared paints for metal surfaces. H: A.
Gardner. Ry Age (Mech ed) 89:513-14 O'15;
Same. Eng & Contr 44:346-7 N 3'15
Preservative coatings for steel. Iron Age 96:
23 Jl 1'15
Protection of iron and steel. J. W. Gibbons.
il Ry Age (Mech ed) 89:538-1 N'15

Preservative coatings for steel. Iron Age 30. 23 Jl 1 '15
Protection of iron and steel. J. W. Gibbons. il Ry Age (Mech ed) 89:580-1 N '15
Protection of iron and steel by paint films.
A. Dubois. il Sci Am S 77:85-6 F 7 '14;
Same abr. Sci Am S 79:160 Mr 6 '15
Reflection from painted surfaces. L: Bell. Elec
W 65:211-12 Ja 23 '15; Same. Am Gas Light
J 102:91 F 8 '15; Same cond. Ind Eng 15:80

Study of some curious painting phenomena. H: A. Gardner. il J Fr Inst 179:681-95 Je '15; Abstract. Am Soc M E J 37:416-17 Jl '15 Study of vapors from drying paint films. H. H. King, diags J Ind & Eng Chem 7:502-4 Je

Tar paint proves better than lead paint on pipes. B. Dibble. Eng Rec 72:349-50 S 18 '15; Same. Eng N 74:973-4 N 18 '15; Same cond. Eng & Contr 44:181 S 8 '15 Washing paint charged to infected oil. Eng N 74:177 Jl 22 '15

See also Corrosion and anti-corrosives

Testing

Comparative exposure test of vehicles for paint. C. M. Chapman. Eng N 73:70-1 Ja 14

Paint and dye testing; use of the white flame arc as a standard, W: R. Mott. Sci Am S 80: 350-2 N 27 '15

Paint shops Piece work for the paint shop. H. Heffelfinger. Ry Age (Mech ed) 89:526 O '15

Painting

Artistic painting and the old masters. M. Toch il J Fr Inst 179:47-58 Ja '15

See also Mural painting and decoration Paint; Painting, Industrial

Painting, Industrial
Brushless paint shop. G: D. Babcock.
Iron Age 96:793-6 O 7 '15

Care and maintenance of gas holders. J. H Braine. il Am Gas Inst Pro 9:pt 1, 807-22 '14: Same cond. Am Gas Light J 101:373-5 I 7'14

Economical handling of maintenance of way painting. Ry Age 57:1134 D 18 '14 Electric equipment for painting without & brush. il Elec W 66:1050 N 6 '15

Hints on painting exterior woodwork. il Bld; Age 37:65-6 Jl 15

Maintenance of way master painters' convention. Ry Age 57:1137-41 D 18 '14

Maintenance of way master painters' 1 annual convention. Ry Age 59:968-9 N 19

Painting, Industrial Continued
Paint as an aid in making the public more
friendly to the railroads. E: H. Brown. Ry
Age 59:969 N 19 '15
Painting defects; their causes and prevention. G. W. Thompson. ii J Ind & Eng Chem
7:136-45 F '15; Excerpts. Ry Age 57:1138-41
D 18 '14; Excerpts. Eng N 73:376-8 My 6 '15
Painting old brick walls. Bldg Age 37:24-5 My

Study of some curious painting phenomena. H. A. Gardner. il J Fr Inst 179:681-95 Je '15; Abstract. Am Soc M E J 37:416-17 Jl

See also Car painting; Concrete—Painting; Painting, Structural

Painting, Structural

Economy of skilled mechanics. E: H. Brown. Ry Age 57:1141 D 18 '14 Paint required for structural work. Eng & Min J 100:801-2 N 13 '15

Paints for steel structures. Iron Tr R 56:1062-

Proper painting for steel work. Iron Tr R 55: 1036-7 D 3 '14; Same cond. Eng M 48:758-60

Some paint and painting factors. H. Lowe. Eng Rec 71:428 Ap 3 '15 See also Automobiles—Painting; Car paint-

ing: Concrete-Painting

Paintings

Artistic painting and the old masters. M. Toch. il J Fr Inst 179:47-58 Ja '15

Paints, See Paint

Paleography. See Inscriptions

Palestine

Industries and resources
Farming in Palestine, E. F. Beaumont, il Sci
Am 113:162-3 Ag 21 '15

## Railroads

Sce also Railroads-Palestine

Palimpsests

Fluorescent photographs of palimpsests. Sci Am 112:191 F 27 '15

Palisades

Making a road up the Palisades, il plan Eng N 74:998-1000 N 18 '15 Roodway up the Palisades, il Munic J 37: 949-53 D 31 '14

Palladium

Determination of hydrogen in gas mixtures by means of colloidal palladium, G. A. Burrell and G. G. Oberfell, J Ind & Eng Chem 6: 992-4 D '14

Determination of platinum, palladium and gold. A. M. Smoot. Eng & Min J 99:700-1 Ap 17 '15

Panama (city)

Streets

Road and street work in the city of Panama. H: W. Durham. il Good Roads n s 10:144-6 S 4 '15

Water supply

arly municipal water works at Pa C. E. Davis, J Fr Inst 180:561-6 N '15 Panama.

Panama-California exposition. See San Diego, California—Panama-California exposition

anama canal
Design features of the Gatun river bascule
bridge. P. L. Kaufman. plan Eng & Contr
44:13-14 Jl 7 '15
Electricity in the construction and operation
of the Panama canal. E: Schildhauer. il
diags Gen Elec R 18:sup679-780 Jl '15
Gatun dam; paper presented at meeting of
Am. Soc. C. E., May 1, 1604. C. D. Ward.
Sci Am S 79:247 Ap 17 '15
Large coaling stations on the Panama canal.
il diag Eng N 74:254-6 Ag 5 '15
Penton reilread bridge agents, the Panama

Pontoon railroad bridge across the Panama canal, diags Ry R 56:82-4 Ja 16 '15

Pontoon swing-bridge over the Panama canal. Eng N 73:126 Ja 21 '15

Purchasing supplies for the Panama canal. F. C. Boggs. Iron Age 96:1180-2, 1226-7 N 18-25 '15

Swinging pontoon bridge carries railroad across Panama canal, diags Eng Rec 71:270-1 F 27 '15

Commercial aspects

Commercial aspects

Effects of the Panama canal on railway traffic. Ry Age 57:1111-12 D 18 '14

Manufacturer's interest in the Panama canal.

J. F. Springer. il Am Ind 15:13-15 Mr '15

Panama canal and the ports of the Pacific.

A. J. Quigley. il maps Eng M 48:493-7, 64157, 808-26; 49:1-17 Ja-Ap '15

What Panama canal means to commerce and trade; abstract. E. R. Johnson. Eng Rec 72:389-90 S 25 '15; Ry Age 59:605-6 O 1 '15

# Culebra cut

Daily survey at Culebra cut safeguards passing vessels. Eng Rec 71:91 Ja 16 '15 Nature as a canal builder. Sci Am 113:354 O 23 '15

See also Panama canal-Slides

### Electric equipment

Electric equipment

Electric towing at Panama. il diag Elec Ry
J 45:235-7 Ja 30 '15

Electricity in the construction and operation
of the Panama canal. E: Schildhauer. il
diags Gen Elec R 18:supt79-780 Jl '15

Mechanical and electrical features of the Panama canal. E: Schildhauer. Elec R & W
Elec'n 66:397 F 27 '15

Towing locomotives for the Panama canal.
C. W. Larson, il diags Gen Elec R 18:101-17
F '15; Same cond. Eng N 73:145-7 Ja 28 '15;
Ry Age 58:189-91 Ja 29 '15; Elec R & W
Elec'n 66:187-91, 233-7 Ja 30-F 6 '15; Elec W
65:288-90 Ja 30 '15; Eng Rec 71:134-6 Ja 30
'15; Ry R 56:150-3 Ja 30 '15; Sci Am S 79:72-4
Ja 30 '15; Eng M 48:744-8 F '15; Int Marine
Eng 20:161-2 Ap '15; Engineer 119:323-5 Ap
2 '15;

Equipment

Coal handling at Panama. il plans Power 42: 106-10 Jl 27 '15; Abstract. Eng M 50:441-3 D

Experiences gained from reinforced-concrete barges built for the Panama canal. W. Rowland. diags Eng Rec 71:684-6 My 29 '15 Failure of Panama crane Ajax. F. H. Cooke. il diags Eng N 73:918-23 My 13 '15; Abstract. Eng M 49:584-7 Jl '15

Failure of the great German crane of the Panama canal, Eng N 73:947-8 My 13 '15

Panama crane contract, F. H. Cooke, il diags Eng N 73:913-17 My 13 '15

#### Locks

Construction details of the Panama canal lock gates; with discussion. R. A. Pender-grass, il Eng Soc W Pa 30:693-736 N '14

Lock entrance caisson for the Panama canal. L: A. Mason, il diag plan Gen Elec R 18: 210-16 Mr '15; Same cond. Eng N 72:1099-1102 D 3 '14

Paint protection of the Panama canal lock-gates. H: Goldmark. Eng N 72:1227 D 17 '14

# Maps

Great relief map of the Panama canal, il Eng N 73:337-8 F 18 '15

Model

Five-acre model of the Panama canal. il Sci Am 112:366-7 Ap 17 '15

Panama canal in miniature operates at exposition, il Eng Rec 71:434-5 Ap 3 '15 Working model of the Panama canal at the exposition. Eng N 73:338 F 18 '15

## Slides

Dredging work on the Panama canal slides. W. G. Comber. il maps Eng N 73:753-7 Ap 22 '15

How the slides develop at Panama. il Sci Am 113:373 O 30'15

Panama slides; report to the Secretary of war. G; W. Goethals, il map Eng N 74:1009-15 N 25 '15; Same. Eng Rec 72:652-6 N 27 '15 Problem of the slides at Culebra. Sci Am 112: 152 F 13 '15

Panama Canal Zone
New faunal conditions in the Canal Zone.
H. E. Anthony. il Sci Am S 79:104-6 F 13 '15 See also Panama canal

Public buildings

Manufacture of hollow concrete block in the Canal Zone—the administration building, il Concrete Cem 6:176-80 Ap '15

Sanitary affairs

Aeration basin of the new water purification plant at Miraflores. G: M. Wells. Eng & Contr 42:489-90 N 18 '14 Early municipal water works at Panama. C. E. Davis. J Fr Inst 180:561-6 N '15

Panama hats

Your Panama hat; from the tropical jungles of South America to the American hat store.

A. M. Jungmann. il Sci Am 112:456+ My 15

Panama-Pacific international exposition. See San Francisco—Panama-Pacific international

Panama railroad

Finances of Panama railroad. Ry Age 58:354-5

Underground wires on the Panama railroad, il Ry Age 58:451-3 Mr 12 '15

Pan-American financial conference

Washington conference; memorandum of Ecuador delegation. V. Gonzales. Am Ind 15: 27-8 Jł '15

27-8 JF '15

Pan-American road congress

Meeting at Oakland, Cal., Sept. 13-17. Good Roads n s 10:181-7 O 2 '15

Meeting at the Municipal auditorium, Oakland, Sept. 13-17. Munic J 39:515-16 S 30 '15

Pan-American road congress and the organizations under the auspices of which it will be held. Good Roads n s 10:147-53 S 4 '15

Preliminary plans and list of officers. Munic Eng 48:278 Ap '15

Proceedings at Oakland. Eng Rec 72:367-8, 397-8 S 18-25 '15

Pan-American scientific congress

Pan-Americanism. G. L. Swiggett. Met & Chem Eng 13:513-14 Ag '15

Pan-American scientific congress, 2d Executive committee. Eng & Min J 100:790 N

Program., Apr Inst Min E Lul 108;xvii-xx D

loongress to be held in Washington, D. C., Dec. 27, 1915, to Jan. 8, 1916; committees. Eng & Min J 99:622 Ap 3 '15

Pancreas Digestive activity and composition of different fractions of the pancreas, J. H. Long, M. Hull, and H. V. Atkinson. Am Chem Soc J 37:2427-20 O '15

Reaction of the pancreas. J. H. Long and F. Fenger. Am Chem Soc J 37:2213-19 S '15

See also Digestive ferments

Pancreatic amylase
Comparison of certain properties of pancreatic
and malt amylase preparations, H. C. Sherman and M. D. Schlesinger, Am Chem Soc
J 37:1305-19 My '15

Panel boxes

Panel box for industrial plants. C: J. Whit-field. diags Elec W 66:73-4 Jl 10 '15

Panics

Panic economies and emergency problems with especial reference to the present industrial situation. F. A. Waldron. Am Soc M E J 36:413-17 D '14; Same cond. Ind Eng 14:397-400 O '14; Discussion. Am Soc M E J 36:417-19 D '14

Sec also Business depression

Papaverine

ew color reaction for papaverine. L. E. Warren. Am Chem Soc J 37:2402-6 O '15

Paper

Soc 10:379-87 no 5 '15

Diffusing media; the optical properties of photographic papers. Illum Eng Soc 10:388-93 no 5 '15

New field for the printer; advertising on pa-per wrappers. T: H. Stark, Inland Ptr 56: 45-7 O '15

Seventy years of inventions. Sci Am 112:517-18

Special paper for recording instruments, drawings and similar purposes. Met & Chem Eng 13:193 Mr '15

Sec also Photographic paper

Testing

From paper-mill to pressroom. W: B. Wheel-wright. Inland Ptr 55:828-30 S '15
Testing the gloss of paper and other materials. diag Illum Engr 8:425-7 O '15

Paper, Photographic, See Photographic paper

Paper, Photographic, See Photographic paper Paper making and trade
Contributions of the chemist to the pulp and paper industry. F. L. Moore, J Ind & Eng Chem 7:292-3 Ap '15
Electricity in manufacture of wood-pulp paper. il Elec R & W Elec'n 67:223-6 Ag 7 '15
Electricity in paper making. W. B. Conant. il Elec R & W Elec'n 66:371-5 F 27 '15
Evolution of the pulp and paper industry. T: J. Keenan. Sci Am S 80:131 Ag 28 '15
From paper-mill to pressroom. W: B. Wheel-wright. il Inland Ptr 54:531-3. 655-6, 791-2; 53:91-3. 204-6, 377-8, 525-7, 681-2, 828-30; 56: 93-5, 204 Ja-N '15
Long price-list. Inland Ptr 54:501-2 Ja '15
Paper and stationery trade of the world. G. Dawe. U S Sp Cons Rep 73:1-453 '15
Papermaking and its machinery. Engineer 120:309-10, 232-4, 358-61, 380-3, 403-5, 426-8 O 1-N 5 '15
Progress in chemical pulp industry; abstract. A. Klein. J Fr Inst 179:507-8 Ap '15
Special prices on paper to printers. B. Hope. Inland Ptr 54:331-3 D '14
Sulphite-solution plant of reinforced concrete: four 99-foot towers 8.5 feet in diameter with a special tile lining. il Eng Rec 70:610 D 5 '14

Rece also Paper mills

See also Paper mills

Paper-making machinery
Electricity in paper making. W. B. Conant. il
Elec R & W Elec'n 66:371-5 F 27 '15
Papermaking and its machinery. il diags Engineer 120:332-4, 358-61, 380-3, 403-5, 426-8 O 8-N 5 '15

Paper mills

Electricity saves paper mill \$400 a month, il Elec W 55,673 Mr 13 '15 Paper mill industry, W. L. Merrill, Am Inst E E Pro 34:3044-7 D '15 Paper mill power plants, W. Weaver, Power 42:349 S 7 '15

See also Paper making and trade

Paper money
Comfort for workers in Washington's government buildings. D. A. Willey. il Sci Am S
78:373-4 D 12 '14

Paraguay Roosevelt-Rondon scientific expedition, L. E. Miller, il Sci Am S 79:248-9 Ap 17 '15

# Stars

Photographic determination of stellar paral-laxes with the 60-inch reflector of Mount Wilson observatory. Sci Am 113:153 Ag 21

Parallel operation. See Dynamos

Parallel operation. See Egyment Parcel post Efficiency in the post office department. Ry Age 57:1110-11 D 18 '14 Government view of government management. Ry Age 59:551-3 S 24 '15 Parcel post and its effects on railway revenues: abstracts. V. J. Bradley. Ry Age 57: 1046 D 4 '14: Eng M 48:593-6 Ja '15 Shipping ore by parcel post. Eng & Min J 100:348 Ag 28 '15

Sec also Mail handling; Railway mail ser-

vice Parenthetical clauses. W. P. Root, Inland Ptr 55:477-8 Jl '15

Paris

Impressions of a member of the institute, now in Paris. C: Butler. Am Inst Arch J 3:495-6 N '15

#### Paris Continued

#### Siege, 1870

Use of balloons during the siege of Paris, table and charts showing number of ascensions and results, Sci Am S 80:229 O 9

Parks

Common sense labels on park trees, J. J. Levison, Am For 21:1062-3 N '15 Concrete park seats, W. B. Conant, il diag Munic J 38:592-3 Ap 29 '15 Jamestown's hundred acre lot, S. W. Allen, il Am For 21:567-70 Ap '15 Methods and cests of planting a small park to grass, making paths and planting hedge, H. R. Ferriss, Eng & Contr 43:320 Ap 7 '15 Park engineering, W: T. Lyle, Munic J 38: 660-1 My 13 '15 Playground for a small city: Jones park, East St. Louis, W. Webb, il Munic Eng 47:424-6 D '14

See also Baseball parks: St. department; Zoological gardens St. Louis-Park

Parks, National. See National parks

Parlor cars Steel parlor cars for Waterloo-Cedar Rapids line, il plan Elec Ry J 45:932-4 My 15 '15

Parrish museum. See Southampton, Long Island—Parrish museum

Parthenogenesis

Recent studies in the dynamics of living mat-ter. D. W. Thompson, Sci Am S 80:301 N 6

Partitions

Partitions of translucent pressed-glass units. il Eng N 72:1269 D 24 '14

Partnership

Is a profit sharer always a partner? E. J. Buckley. Metal Work 82:803 D 18 '14 Legal principles governing the determination of partnership assets. C. R. Cross. J Account 19:97-106 F '15

Partnership liquidation. S. Walton. J Account 19:146-8 F '15

Partnership settlements. S. Walton, J Account 20:236-8 S '15

Powers and liabilities of partners. Dom Eng 71:154 My 8 '15

See also Commercial law

# Pasadena, California

Lighting

Municipal operation in Pasadena, Cal.; analysis and review of annual reports. Elec W 65:1171-3 My 8 '15

Pascal, Jean Louis

Institute gold medalist, 1913. W. Cook. il por Am Inst Arch J 3:19-26 Ja '15

Passalc, New Jersey

Sanitary affairs

Collecting ashes and garbage in A. Reid. Munic J 38:35-6 Ja 14 '15 Passaic.

Passaic valley sewer Constructing Passaic valley pumping station. il plan Munic J 38:341-44 Mr 18 '15

Constructing Passaic valley sewer, il plan diag Munic J 38:213-17 F 18 '15

Constructing pumping station in unbraced cofferdam formed by outside walls, il plans Eng Rec 71:292-4 Mr 6 '15

Construction features on the Passaic valley sewer. il diags Munic J 38:59-62 Ja 21 '15

Tunnel driving record on Passaic valley sewer. Munic J 38:506 Ap 15 '15

Passementerie

Passementerie mill. plans Textile World 48: 445-7 Ja '15

Passenger fares. See Railroads-Fares

Passenger traffic officers, American association of See American association of passenger of. See Amer traffic officers

Passivity

Passivity of metals. H. G. Byers and S. C. Langdon, diags Am Chem Soc J 36:2004-11

Phenomenon of passivity in connection with ferrous alloys of different composition and structure, H. W. Moseley, Am Chem Soc J 37:2326-33 O '15

Patent laws and legislation

Application for and prosecution of applications for United States letters patent. S. C. Mastick, J Ind & Eng Chem 7:874-82 O'15
Big handicap to industry. L. W. Moffett. Iron Tr R 56:557-60 Mr 18'15
Contractual rights relating to letters patent; Actions for infringements. S. C. Mastick. J Ind & Eng Chem 7:874-91 N'15
Court of appeals decision in the pyrophoric alloy suit, Met & Chem Eng 13:145-6 Mr'15
Court rules on validity of foundation patent. Eng Rec 71:154-5 Ja 30'15
Decision in the United shoe machinery case. Sci Am 112:322+ Ap 3'15
Hearing of the proposed amendment of the patent laws. L. H. Backeland and others. Met & Chem Eng 13:76-81 F'15
Hearing on the Paige patent bill. Textile World 48:368-75 F'15
Major and minor patents proposed. S. E. Hitt. Iron Tr R 56:723 Ap 8'15
Patent legislation. C. D. Paige. Textile World 49:202-5 My'15
Patents and the courts. A. B. See. Am Ind 15:32-3 Jl'15
Patents involved in shoe machinery decision.

15:32-3 Jl '15
Patents involved in shoe machinery decision. Elec W 65:825-6 Mr 27 '15
Theory and statement of the law relating to patents generally and to patents for compositions of matter and chemical processes specifically. S. C. Mastick. J Ind & Eng Chem 7:789-97 S '15
Times of priority in Germany and France. Sci Am 113:4 Jl 3' '15
Use of patented articles: court decisions in the several states as to conditions under which cities may contract for patented pavements and other articles. J. Simpson. Munic J 38:13-15 Ja 7 '15
Use of patented pavements by cities. Eng N 73:507 Mr 11 '15; Same. Sci Am 112:323+ Ap 3 '15

# Compulsory working

Compulsory working
Coal-tar dyes and the Paige bill; compulsory working of patents. B. C. Hesse. J Ind & Eng Chem 7:963-74; Discussion. H. E. Stonebraker; B. C. Hesse. 7:974-8 N '15
Commissioner of patents on compulsory licenses. T: Ewing. Sci Am 112:248 Mr 13 '15
Compulsory licenses. Sci Am 112:381 Ap 24 '15
Compulsory licenses and working clause. Sci Am 112:591 Je 12 '15
Compulsory working of patents. S: S. Dale. Sci Am 113:199 S 4 '15
Compulsory working of patents in the United States, Germany and Great Britain. B. C. Compulsory working of patents in the United States, Germany and Great Britain. B. C. Hesse. J Ind & Eng Chem 7:304-7 Ap '15; Same. Sci Am S 80:94-5 Ag 7 '15
Symposium on compulsory working of patents and designs in England. J Ind & Eng Chem 7:307-17 Ap '15; Same cond. Sci Am S 80: 95-6 Ag 7 '15
Working clause in the patent law. Textile World 49:170-1 My '15

Patent lawyers

Word about coupon attorneys or those of the "no patent no pay" variety. Sci Am 113:431 N 13 '15

Patent office. See United States-Patent office Patents

Danger of throwing inventions open to the public. H: D. Hibbard. Met & Chem Eng 13:206 Ap '15
Donation of patents to the public. Sci Am 112:433 My 8 '15

112:433 My 8 '15
How shall patented materials or processes on public works be handled? D. B. Luten; S. Whinery. Eng Rec 72:546-9 0 30 '15
How shall patented materials or processes on public works be handled? G; C. Warren; S. Whinery. Eng Rec 72:51-12 (1)
How to proceed in obtaining them. S. Roth, Metal Work 84:501-4 O 15 '15
Roth, Metal Work 84:501-4 O 15 '15

Inventors too cautious. Sci Am 113:106 Ag 7

Needed changes in the patent system. Met & Chem Eng 13:468-9 Ag '15

Continued Patents

Patents and foreign competition; by a British chartered patent agent. Engineer 119:106-7 Ja 29 '15; Discussion. 119:158, 182, 206, 226 F 12-Mr 5 '15
Patents and their purpose; notes of historic interest. J. L. MacAuliffe. Sci Am S 79:354-5 Je 5 '15

Proposed patent reform. Eng & Min J 100:531-

Proposed patent recognition of patents, G: C. Warren. 2 S 25 '15

Public recognition of patents, G: C. Warren. Munic Eng 48:172-7 Mr '15

Railroad supply co. wins its case against inrealroad supply co. wins its case against infringers of the Wolhaupter patents. il Ry R 56:60-6 Ja 9 '15
Report of the commissioner of patents. Sci Am 112:205+ F 27 '15
Rights of joint owners of patents. Sci Am 113:226 S 11 '15

Inguis of joint owners of patents. Sci Am 113:226 S 11 '15

State should deal directly with patentees of processes and materials in public work. S. Whinery. Eng Rec 72:73-4 Jl 17 '15

Suggestion in patent reform. Sci Am 112:414

My 1 '15

Why is the patent mania? W. E. Greenawalt.

Eng & Min J 99:543-4, 1040-1 Mr 20, Je 12 '15

Why is the patent mania, or why is the patent office? S. Croasdale, Eng & Min J 99.250-1 office? S. Croasdale. Ei 744-5 Ja 30, Ap 24 '15 Eng & Min J 99:250-1,

See also Automobiles—Patents; Chemical patents; Inventions; Metallurgical patents; Patent lawyers and legislation; Patent lawyers; Pavements—Patents; Trademarks; United States-Patent office

Patents, Compulsory working of See Paten laws and legislation Compulsory working

Pathological psychology, See Psychology, Pathological Patriotism

Random reflections. Sci Am 112:326+ Ap 3

Pattern making

Cattern making
Chords of angles from one to ninety degrees.
S. L. Cook, Foundry 43:416a O '15
Inexpensive base plate pattern, S. B. Phelps,
diags Foundry 43:466+ N '15
Lengths of chords for segments of different
circles. S. L. Cook. Foundry 43:322a Ag '15
Making a herringbone grate pattern, E. L.
Scillitoe, diags Foundry 43:184 My '15
Outside diameters for polygons. S. L. Cook.
Foundry 43:454a N '15
Patternmaker's table for rounding corners and
other useful tables. S. L. Cook. Foundry 43:
182a My '15
Patternmaking for molding machine.

Patternmaking for molding machine work E. I. Chase. Iron Age 96:932-3 O 21 '15 Reducing the cost of foundry patterns. D Gordon, il diags Iron Age 95:1277-9 Je 10

Sec also Foundry practice; Sheet metal work—Pattern making

Pattern storage
Miscellaneous stands for use in the foundry.
A. Hill, diags Foundry 43:301-3 Ag '15
Pattern storage systems for factories. J: G.
Shirley. Iron Age 96:304-6 Ag 5 '15
Place for pattern plates. F. West. il Foundry
43:303 Ag '15

Pavements

avements
Advantages and disadvantages of the single
gutter pavement. W. G. Kirchoffer. Eng &
Contr 44:190-1 S 8 '15
American society of municipal improvements
convention, Dayton, Ohio. Eng N 74:810-12
O 21 '15

Appellate court of the state of New York and the question of allowances for paying over mains in valuation work. J: W. Alvord. Am Water Works Assn J 2:465-81 S '15; Same cond. Eng & Contr 43:532-5 Je 16 '15; Discussion. Am Water Works Assn J 2:482-

Baltimore experience in paving street-railway tracks. H. D. Williar, jr. il diags Eng N 73: 884-5 My 6 '15

Comparative study of pavements based on Chicago conditions. Eng & Contr 43:432-3 My 12'15

Comparison of European and American pavements. Good Roads n s 10:65-6 Jl 17 '15

Cost keeping system for work performed by municipal forces of the Philadelphia bureau of highways. Eng & Contr 48:292-4 Mr 31'15; Same cond. Eng Rec 71:360-1 Mr 20'15 Current paving practice. Munic J 38:626 My 6'15

Discussion on paving. Elec Ry J 45:134-5 Ja

Engineering work preliminary to pavement construction, plans Eng N 74:460-1 S 2 '15 Examination of Akron pavements. Munic J 37:954-5 D 31 '14 Five years' satisfactory experience with a

37:954-5 D 31 '14
Five years' satisfactory experience with a gravel and oil mixed pavement, Concord, Mass. J: M. Keyes. Eng N 73:83-4 Ja 14 '15
General observations on street pavements of European cities. H: W. Durham. Sch Mines Q 36:68-76 N '14

Highway work in New York. Munic J 39:689-

100 N 4 15 Iron sides for roads, il Sci Am 112:254 Mr 13

Manhattan pavements limited to three standard types. H. W. Durham. Eng Rec 71:202-3 F 13 '15 One cause of the inferiority of city pavements in America. L. S. Smith. Good Roads n s 9: 109 Mr 6 15

avement problems and experience in San Francisco. J. M. Owens. il Eng N 72:1180-2 D 10'14 Pavement

Pavement problems; contrasts of foreign and American practice. H: W. Durham, Eng N 72:1182-3 D 10 '14

American practice. H: W. Durham, Eng N 72:1182-3 D 10 '14
Pavements dished in the center. E. McCullough. Eng Rec 71:691 My 29 '15
Paving a leading factor in city betterment; abstracts of papers by C. D. Pollock and others. Eng Rec 72:475-6 O 16 '15
Paving for piers, warehouses and garages. plan Eng N 73:952-4 My 13 '15
Paving methods in Baltimore, Maryland. H. D. Williar, jr. il Eng & Contr 42:344-6 O 7 '14
Paving of streets. H. J. Fixmer. Assn Eng Soc J 55:19-31 JI '15
Paving procedure in American cities. Eng & Contr 42:569 D 16 '14
Philadelphia highway work; use of granite block in street railway tracks and wood block near schools and hospitals. il Munic J 38:619-22 My 6 '15
Practice in paving street-railway tracks. il

Practice in paving street-railway tracks. il diags Eng N 73:888 My 6 '15

Proper rolling of plastic pavements. Wright, Good Roads n s 10:248 N 6 '1

Road and pavement dimensions-widths, depths and crown; with discussion, L. White. Good Roads n s 9:8-14 Ja 2 '15

Road and street work in the city of Panama. H: W. Durham. il Good Roads n s 10:144-6 S 4 '15

San Francisco, the exposition city. il Good Roads n s 10:133-9 S 4 '15

Selection of paving material. G: W. Tillson. Munic J 38:3-7 Ja 7 '15; Same abr. (Rela-tive values of paving materials). Eng & Contr 42:442-4 N 4 '14

Standard practice in the construction of block pavements. Good Roads n s 10:78 Ag 7 '15 Street pavements. C. Hill. Good Roads n s 10: 205-6 O 2 '15

Street pavements, roads and boulevards. A. J. Cleary. il Eng N 73:311-13 F 18 '15

Street paying in Lynn, Mass. H. T. Rich. il Munic J 38:283-4 Mr 4 '15

Street paving in small cities. T: H. Mac-Donald. Good Roads n s 9:73-5 F 6 '15; Ex-cerpts. Munic J 37:960 D 31 '14

Street paving units. Munic J 38:132 F 4 '15 Traffic census and its bearing on the selection of pavements. W. W. Crosby. Good Roads of pavements. W. n s 10:265-6 N 6 '15

Traffic limits of various types of pavements. W. D. Washington. Eng & Contr 42:403-5 W. D. O 28 '14

Trenton's 1914 paving work. H. F. Harris, il Munic J 38:279-80 Mr 4 '15

Use of patented pavements by cities. Eng N 73:507 Mr 11 '15; Same. Sci Am 112:323+ Ap 8 '15

Pavements—Continued
Value of paving materials disclosed by two
years' service test in New York. H. W.
Durham. Eng Rec 71:203-4 F 13 '15

See also Asphalt; Bridges—Floors; Concrete; Curbs; Gutters; Paving machinery; Roads; Roads, Macadamized; Sidewalks; Street openings; Streets

Asphalt paving in Columbia; determination of cost by force account. J: McNeal, il Munic J 39:539-41 O 7 '15
Asphaltic and bitulithic pavements. R. S. Dulin; R. G. McMullen. Assn Eng Soc J 55: 67-79 S '15; Discussion. Assn Eng Soc J 55:79-94 N '15 S '15

S '15
Construction details and costs. Munic J 38: 133-5; tables 144-52, 188-9 F 4-11 '15
Cost of asphaltic concrete pavement with small portable mixer. diag Eng N 73:1037-8
My 27 '15
Cost of brick pavements. V. M. Pierce and C. H. Moorefield. Eng & Contr 44:132-3 Ag 18 '15
Cost of construction and renair of pavements.

18 '15
Cost of construction and repair of pavements in Philadelphia in 1913; tables. W. H. Connell. Eng & Contr 42:361 O 14 '14
Cost of paving with asphaltic concrete on old macadam. Eng & Contr 44:369 N 10 '15
Costs of brick pavement and of concrete base at Gary, Ind. W. P. Cottingham. Eng & Contr 44:88-9 Ag 4 '15
Experience in paving by day labor at Duluth, Minn. J: Wilson. Eng & Contr 43:445 My 19 '15

19

19°15
Paving by day labor receives trial in Duluth.
Eng Rec 71:333-4 Mr 13'15
Relative 20-year economy of various types of roads and pavements. R. Trautschold. Eng & Contr 44:89-91 Ag 4'15
Statistics on paving in cities of the United States; tabulation. Good Roads n s 10:21-40
J1 3'15

See also Pavements—Maintenance and repair; Pavements, Concrete—Cost

Diagram for determining pavement crowns. C: W. Barber. Eng N 74:509-10 S 9 '15
Pavement widths and crowns. H. J. Fixmer. diag Good Roads n s 9:230-1 Je 5 '15; Correction. 10:16 Jl 3 '15
Paving crown best distribution by hyperbolic curve. C. R. Mandigo. Eng Rec 72:549-50 O

#### Cutting

Pavement rooter drawn by street cars tears up brick streets. il Eng Rec 72:117 Jl 24 '15 Tearing up pavement at 500 ft. per minute. il Elec Ry J 46:73 Jl 10 '15

# Expansion joints

Expansion joints in granite-block pavements. il Eng N 74:398-9 Ag 26 '15 Lugs or spacers to prevent expansion failures

Lugs or spacers to prevent expansion failures in wood-block pavements. F. W. Cherrington. Eng N 73:275-6 F 11 '15 1915 practice of prominent builders of concrete roads. Concrete Cem 7:39 JI '15 Perishable dividing plate for expansion joints in concrete. Munic Eng 48:324+ My '15 Road joint protector, il Concrete Cem 7:192 N

Wood-block expansion joint for concrete alley pavements. diag Eng Rec 70:702 D 26 '14

### Experiments

Sec Pavements, Experimental

## Failures

Surface warnings of street subsurface failures. R. Klotz, Eng N 74:831 O 28 '15

# Fillers

Bituminous filler for granite block in Brooklyn, H. H. Schmidt, Eng Rec 71:297-8 Mr (

Joint filiers for granite block pavements. C. D. Pollock, Munic J 39:777-8 N 18 '15; Excerpts. Good Roads n s 10:264 N 6 '15; Excerpts. Eng Rec 72:475 O 16 '15

Pavements with pitch filler. il Munic J 38: 160-2 F 4 '15

#### Foundations

Adaptability and cost of concrete and mac-adam pavement bases in Oakland, Cali-fornia. W. H. Frickstad. Eng & Contr 42: 461 N 11 '14

Prick monolithic construction of county highways. R. L. Bell. il Eng & Contr 44:268-70 O 6 '15; Same cond. (Illinois finds new mortar bed an improvement) Eng Rec 72:453-4

Brick road built monolithic at Paris, Ill. W. T. Blackburn. il Eng Rec 72:54-5 Jl 10 '15 Brick road construction upon a sand base in Hillsborough county, Florida. il Eng &

Brick road construction upon a sand base in Hillsborough county, Florida. il Eng & Contr 44:333-6 0 27 '15

Cement-sand bed best for wood-block paving. C. R. Mandigo. Eng Rec 71:647-8 My 22 '15

Cracking of brick pavements is prevented by a mortar cushion. M. Schuyler. Eng Rec 72: 175-6 Ag 7 '15

Cushions for brick pavements. W: C. Perkins. Munic J 39:655-6 O 28 '15; Same. Eng & Contr 44:336 O 27 '15

Dry sand and cement mixture vs. mortar bed for wood block pavements. T. S. Oxholm. Eng N 73:217 F 4 '15; Same. Munic J 38: 777 Je 3 '15

Mortar beds for brick and stone pavements.

Mortar beds for brick and stone pavements. Eng N 74:163, 273, 517-19 J1 22, Ag 5, S 9

Ohio hio uses cement-sand support for brick pavement. D. Moomaw. Eng Rec 72:455 O 9

Pavement foundations over filled-in trenches. G: H. Fenkell; C. R. Mandigo, diag Eng N 74:228 Jl 29 '15 igid bed eliminates noise and subsurface pockets. F. A. Churchill. Eng Rec 72:455-6

Road foundations. J. A. Johnston. Eng Rec 70:663-4 D 19 '14 Sand-cement and mortar beds for paving—a difference. S. Whinery. Eng N 74:995 N 18

'15
Sand versus motor beds for brick pavements.
W. P. Blair. Eng N 74:903 N 4 '15
Thin concrete base, reinforced, for pavements.
C. S. Pope; J. I. Tucker. Eng Rec 72:174-5
Ag 7 '15
Thin concrete base, reinforced, may save 50
cents a square yard in paving costs. J. S.
Tucker. Eng Rec 71:719-20 Je 5 '15
Vitrified brick construction—streets and roads. W. C. Perkins. Eng Rec 72:476 O 16
'15

### Laws and regulations

Ordinances regulating street excavating—replacement by city. Munic Eng 48:116-18 F '15 Practice relating to patented pavements in American municipalities, M. T. Calef. Eng & Contr 44:103-8 Ag 11 '15 Regulating street excavations; digest of ordinances of eight cities, A. L. Bostwick. Munic J 38:281-2 Mr 4 '15

## Maintenance and repair

Maintenance and repair
Cost of pavement maintenance in Oakland, Cal.
Munic J 39:4-5 Jl 1 '15
Economic limit of pavement repairs. G. E.
Norton. Eng & Contr 43:277-8 Mr 24 '15;
Same. Munic J 39:1-3 Jl 1 '15
Economics of pavement repairing. G: H. Norton. Eng & Contr 44:167-8 S 1 '15
Legality of the Chicago wheel tax. Eng & Contr 43:438-9 My 19 '15
Repairing and resurfacing bituminous pavements. S: H. Lea, il Eng N 72:1308-10; 73:
258-9 D 31 '14, F 11 '15
Street repair in Cleveland, Ohio: with cost tables. P. J. Masterson and others. il Munic Eng 49:171-8 N '15

See also Pavements. Asphalt—Vaintenance

See also Pavements, Asphalt—Maintenance and repair; Pavements, Concrete—Maintenance and repair

#### Patents

Canadian bitulithic patents adjudged valid by the supreme court of Alberta. Good Roads n s 9:156-8 Ap 10 '15 Canadian bitulithic patents sustained. Munic Eng 48:277-8 Ap '15

Pavements - Patents - Continued

avements—Patents—Continued
Hassam Ei-co-mae prevenent, il Good Roads
in 8 10:271-2 N 6 '15
How shall patented materials or processes on
public works be handled? G: C. Warren; S.
Whinery, Eng Rec 72:511-12 O 23 '15
Practice relating to patented pavements in
American municipalities. M. T. Calef. Eng
& Contr 44:103-8 Ag 11 '15
State should deal directly with patentees of
processes and materials in public work. S.
Whinery, Eng Rec 72:73-4 Jl 17 '15
Use of patented articles: court decisions in
the several states as to conditions under
which cities may contract for patented pavements and other articles. J. Simpson. Munic
J 38:13-15 Ja 7 '15

## Repair

# See Pavements-Maintenance and repair

## Specifications

Closed, open or alternate paving specifications? D. T. Pierce. Munic Eng 48:300-1 My

Illinois specifications for concrete and brick pavements. Munic Eng 48:309-10 My '15

# Statistics

Paving statistics of American cities, Munic J 38:133-59 F 4 '15

Statistics of pavement construction in 1914 in United States and Canada. Eng & Contr 43: sup38-49 Ap 7 15 Statistics on paving in cities of the United States; tabulation. Good Roads n s 10:21-54

Street and sidewalk improvement in the United States and Canada. Munic Eng 48:313-58 Je '15

58 Je '15 Street pavements, 1915. Munic Eng 48:252-6 Ap '15

#### Surface treatment

Surface treatment

Maintaining macadam streets in Kansas City.
C. R. Mandigo. Eng Rec 70:641-2 D 12 '14

Methods and cost of laying asphaltic wearing
surface on concrete pavement, Santa Earbara county, California. W. C. Howe. il
Eng & Contr 44:131-2 Ag 18 '15

Methods and cost of resurfacing asphalt pavements in Brooklyn by the surface heater
method. J. C. Huseman. il Eng & Contr 42:
483-5 N 18 '14

Resurfacing old macadam with bituminous
concrete in Chicago. il diag Eng & Contr
42:357-8 O 14 '14

Sec also Pavements Rituminous: Roads

Sec also Pavements, B Bituminous; Roads, Oiled Bituminous; Roads,

# Terminology

# See Roads-Terminology

# Testing

Smoothness-testing machine for pavements. il Eng N 74:751-2 O 14 '15 Tests of smoothness made on various pave-ments. R. D. Kneale, Eng N 74:784 O 21 '15

Pavements, Asphalt

Analyses of asphaltic concrete and asphalt block laid in Washington, D. C. in 1914. Eng & Contr 43:43 Ja 13 15
Anchor block for asphalt block pavements.
G: P. Hemstreet, diag Eng & Contr 43:503
Je 2 15

Asphalt and wood fiber pavement. C: C. Brown, il Munic J 38:766-7 Je 3 '15
Asphalt paving in Columbia; determination of cost by force account. J: McNeal. il Munic J 39:539-11 ()

Asphalt surfaced concrete in California. Munic

Asphalt surfaced concrete in California. Munic J 38:284-5 Mr 4 '15 Binder course in asphalt pavements. R. Klotz. Eng N 74:3-4 Jl 1 '15 Camden's municipal asphalt plant. il Munic J 38:127-9 F 4 '15 Evolution of the asphalt pavement in Toronto, G: Powell, Good Roads n s 9:185 My 1 '15

Nansas City, Mo., n clatains open asphalt specifications. C. R. Mandigo, il Eng N 74: 642-4 S 30 '15

New York city experience with asphalt block pavements. E. J. Morrison, Eng N 73:645-6 Ap 1 '15

New York city experience with asphalt-block pavements. H: W. Durham. il Eng N 73:521 Mr 18 '15

Mr 18 '15
Paving in Salt Lake City; rock asphalt from California and Utah, both limestone and sandstone; sheet asphalt using gilsonite. Munic J 37:958 D 31 '14
Poor sand the cause of the rapid disintegration of a sheet-asphalt pavement. W. M. Cross. Eng N 73:621 Ap 1 '15
Rock asphalt pavements in Salt Lake City, Utah, il Eng & Contr 42:460-1 N 11 '14
Sheet asphalt for Florida roads. G: L. Watson, il Munic J 39:503-6 S 30 '15
Theory of the perfect sheet asphalt surface. C. Richardson. J Ind & Eng Chem 7:463-5 Je '15
Thin asphalt block pavement for New York

Thin asphalt block pavement for New York state highways. L. Grossman. il Eng Rec

Thin asphalt block pavenier of New Torks state highways, L. Grossman, il Eng Rec 70:630-1 D 12 '14 Wood fiber and asphalt as paving materials, il Munic Eng 48:292-3 My '15

See also Pavements, Bituminous; Pavements, Bituminous concrete

#### Maintenance and repair

Asphalt repairing in Manhattan, il Munic J

Asphalt repairing in Manhattan, il Munic J 19:687-9 N 1 15.
Asphalt repairs in small municipalities, W. H. Taylor, jr. il Munic Eng 49:171-3 N 15.
Cost of asphalt repairs in Pittsburg, J. B. Townley, Munic Eng 48:300 My 15.
Economical asphalt relaying with hot mixer, il Elec Ry J 45:1080-1 Je 5 15.
Maintenance and repair of asphalt block pavements, E. J. Morrison, il Eng N 74:352-5 Ag

Methods and cost of resurfacing asphalt pavements in Brooklyn by the surface heater method, J. C. Huseman, il Eng & Contr 42: 483-5 N 18 14

483-5 N 18 '14
One-course method reduces asphalt patching costs 15 per cent. F. N. Bingham. Eng Rec 72:208 Ag 14 '15
Portable mixer uses old asphalt for pavement patches. il Eng Rec 71:746 Je 12 '15
Repairing asphalt pavements without a plant. F. N. Bingham. il Eng N 74:314-15 Ag 12

Planting sheet asphalt with home-made plant, Norfolk, Va. W. H. Taylor, jr. Eng & Contr 44:351-2 N 3 '15
Resurfacing asphalt pavements in San Francisco, Calif. J. Owens. il Eng N 73:74 Ja 14 '15

Pavements, Bitulithic ic pavement and Warrenite roadway. Perkins, il Boston Soc C E J 1:119-31

Alr '14
Canadian bitulithic patents adjudged valid by the supreme court of Alberta. Good Roads n s 9:156-8 Ap 10 '15
Canadian bitulithic patents sustained. Munic Eng 48:277-8 Ap '15
Organization and work of a national paying company. il Eng N 73:712-16 Ap 15 '15
Resurfacing macadam streets with bitulithic, il Munic Eng 49:88 Ag '15
Resurfacing old macadam roads with Warrenite. il map Good Roads n s 8:222-6 D 5 '14

Pavements, Bituminous
Asphaltic and bitulithic pavements. R. S.
Dulin; R. G. McMullen. Assn Eng Soc J 55:
67-79 S '15; Abstract. Am Soc M E J 37:657
N '15; Discussion. Assn Eng Soc J 55:79-94

Bituminous construction and maintenance; with discussion. W: D. Uhler. Good Roads n s 9:64-7 F 6 '15; Abstract. Eng Rec 70:663

Cementing value of bituminous binders. L. Kirschbraum, il diags J Ind & Eng Chem 6:976-85 D '14; Same. Eng & Contr 43:39-43 Ja 13 '15

Colloidal bituminous pavement. il Munic J 38: 807-8 Je 10 '15

Effect of leaking illuminating gas on bituminous pavements. E. C. Jones. Am Gas Light ous pavements. E J 102:25 Ja 11 '15

Effect of leaking illuminating gas on bituminous pavements. G: C. Warren. Eng & Contr 42:405 O 28 '14; Excerpts. Eng N 73: 441 Mr 4 '15

Pavements, Bituminous Continued
Laying a new bituminous pavement at West
Pittson, Pa. il Munic J 39:183-5 Ag 5 T5
Maintaining macadam streets in Kansas City.
C. R. Mandigo. Eng Rec 70:641-2 D 12 '14
New Jersey road experiences. Munic J 39:
5-6 Jl 1'15
Repairing and resurfacing bituminous pavements. S: H. Lea. il Eng N 72:1308-10; 73:
258-9 D 31 '14, F 11' '15
Specification and selection of asphaltic materials for street pavement. F: O. X. M'Laughlin. Sch Mines Q 36:30-9 N '14
Types of bituminous construction. F. P. Smith. Munic Eng 49:168-70 N '15; Same. Munic J 39:652-5 O 28 '15

\*\*Ree also\*\* Pavements, Asphalt; Pavements, Bituilithic; Roads, Bituminous
Pavements, Bituminous concrete

Bituithic; Roads, Bituminous

Pavements, Bituminous concrete

Adapting an old racetrack to automobile racing. il Eng N 74:603-4 S 23 '15

Bituminous concrete pavement construction in Washington, D. C. M. Brooke. il Eng & Contr 43:325-6 Ap 7 '15

Cost of asphaltic concrete pavement with small portable mixer. diag Eng N 73:1037-8 My 27 '15

Cost of paving with asphaltic concrete on old macadam. Eng & Contr 44:369 N 10 '15

English specifications for a bituminous concrete mixing plant and details of the acceptance test. W. H. Grieves. Eng & Contr 42: 325-6 S 30 '14

Methods and cost of removing an asphaltic macadam road surface, reworking the old material and relaying it as asphaltic concrete. G. C. Dillman. il diag Eng & Contr 42:532-3 D 9 '14

Methods and mixtures used in constructing

42:332-3 D 9 14
Methods and mixtures used in constructing tar concrete pavements. P. P. Sharples. il Eng & Contr 43:256-8 Mr 17 '15
Stone-filled asphalt surface or fine asphalt concrete. C. Richardson, Eng Rec 70:634 D

T2 '14
Topeka pavement in Queens borough, New York, after two and one-half years. F: A. Reimer. il Good Roads n s 9:246-8 Je 12 '15
What is asphaltic concrete? Munic J 38:697-8
My 20 '15

Bituminous paving brick, il Good Roads n s Pavements, Brick

Bituminous paving brick, il Good Roads n s 10:162 S 4 '15
Brick pavement design. W. D. P. Warren. Eng & Contr 44:2-4 Jl 7 '15
Brick pavement experience in Toronto, Ont. il Eng N 73:168-9 Ja 28 '15
Brick pavement lasted 24 yr.; new pavement also brick, Jackson, Mich. H. K. Higgins. il Eng N 74:542 O 28 '15
Brick pavement on old macadam base. E. S. Smith. il Munic Eng 48:312 My '15
Brick paving in King county, Washington. il Good Roads n s 10:3-4 Jl 3 '15
Brick paving lessons learned in over-coming faults of original designs, Greenville, Texas. A. D. Duck. il Eng & Contr 44:382-4 N 17 '15
Brick paving on steep grades; recent practice in Toronto, Ont. F. A. Churchill. il Munic Eng 48:10-15 Ja '15; Same, with discussion. Good Roads n s 9:56-60 F 6 '15
Cost of brick pavements. V. M. Pierce and C. H. Moorefield. Eng & Contr 44:132-3 Ag 18 '15
Costs of brick pavement and of concrete base at Carve Ing W. D. Cattingham. Page 6

Costs of brick pavement and of concrete base at Gary, Ind. W. P. Cottingham. Eng & Contr 44:88-9 Ag 4 '15

Costs of monolithic brick road construction. R. L. Bell. Eng & Contr 44:369 N 10 '15 Cracking of brick pavements is prevented by a mortar cushion. M. Schuyler. Eng Rec 72: 175-6 Ag 7 '15

Cushions for brick pavements. W: C. Perkins, Munic J 39:655-6 O 28 '15; Same. Eng & Contr 44:336 O 27 '15

Economical paving with 3-in. brick. Eng N 73:

Examples of long-lived pavements. il Good Roads n s 10:81-2 Ag 7 '15

Grout filler in brick paving. F. A. Churchill. Concrete Cem 6:94-5 F '15

How to apply filler to vertical fiber brick pavement. Munic Eng 48:115-16 F '15 Kansas City tries thin brick with sand-asphalt surface. C. R. Mandigo. Eng Rec 71:546-7

surface. C. R. Mandigo. Eng Rec 71:546-7 My 1 '15
Methods and costs of grouting brick pavements. diags Eng & Contr 44:302-4 O 20 '15
Mortar cushion in Houston eliminates pavement maintenance. W. M. Archibald. il Elec Ry J 46:1045 N 20 '15
Omit transverse joints in brick pavements. Eng Rec 72:206 Ag 14 '15
Paving work in Meadville, Pa. B. F. Miller, jr. Munic J 37:804 D 3 '14
Rattler test for paving brick abandoned in St. Louis. M. Schuyler. Eng Rec 72:200-1 Ag 14 '15

Repairing brick pavements after street excavations. P. J. Masterson. Eng N 73:997 My 20 '15; Same. Good Roads n s 9:190 My 1'15; Munic Eng 48:308-9 My '15; Munic J 38:628-9 My 6 '15

38:628-9 My 6 '15
Sand versus mortar beds for brick pavements.
W. P. Blair. Eng N 74:903 N 4 '15
Study of brick pavement construction. W. P.
Blair. Good Roads n s 10:264-5 N 6 '15
Subdrainage of brick-paved streets, Lakewood,
Ohio. E. A. Fisher. diags Eng N 74:557-8
S 16 '15

Surfacing bridges. F. R. Lander. il Munic Eng

49:50-1 Ag '15
Thin concrete base for brick pavement. J. L.
Harrison, Eng & Contr 44:91-2 Ag 4 '15
Vertical fiber brick paving. J. I. Tucker. Munic
Eng 49:114-16 S '15
Vitrified brick construction—streets and
roads. W. C. Perkins. Eng Rec 72:476 O 16

Vitrified-brick pavement on an old macadam base, Carlisle, Penn. J. C. Hiteshew. il diag Eng N 72:1262-3 D 24 '14

See also Roads, Brick

Pavements, Care of
Protecting newly paved streets at Baltimore.
Eng N 73:55 Ja 14 '15

Eng N 73:55 Ja 14 '15

Pavements, Concrete

A. S. M. I. concrete pavement specifications.
Good Roads n s 10:267 N 6 '15
Concrete alley paving in Chicago. S. E. Bates.
il Munic Eng 49:147-8 O '15
Concrete alley paving with wood block joints in Baltimore. Concrete Cem 7:42 Jl '15
Concrete curb and gutter as constructed in Denver, Colo. E. B. Van de Greyn. il Munic Eng 48:16-18 Ja '15
Concrete for paving. G. W. Pickels. il Munic Eng 48:50-2 Ja '15
Concrete pavement damaged by a fire. C. C. Wiley. Eng N 73:936-7 My 13 '15
Concrete pavement design. W. D. P. Warren. Eng & Contr 42:570-1 D 16 '14; Same. Munic Eng 48:55-2 Ja '15
Concrete pavement in the track allowance.
H. C. Campbell. il Elec Ry J 46:998-1000 N
13 '15

H. C. 13 '15

Concrete pavements of Sioux City, Iowa. T. H.
Johnson. il Eng N 73:1110-12 Je 10 '15
Concrete pavements with dished surfaces;
substitution of center for side-gutters. il
Eng Rec 71:555 My 1 '15
Concrete paving on Walnut street, Macon,
Georgia. C. H. Fuller, il Good Roads n so
94-5 Mr 6 '15
Costs reduced by monolithic curb, gutter and
pavement. il diags Eng Rec 71:111 Ja 23 '15
Crushed limestone aggregate for concrete

Crushed limestone aggregate for concrete pavements. A. M. Wolf. Eng N 74:902 N 4

Design and construction of a concrete pave-ment in the village of Glencoe, Ill. il diags Eng & Contr 42:393-4 O 21 '14

Details of a reinforced concrete pavement in Morgan Park, Ill. il diags Eng & Contr 42: 212-13 Ag 26 '14

Dividing plate of perishable material for expansion joints in concrete. il Munic J 39:201 Ag 5 '15

Eliminating concrete road joints, H. E. Bilger, Eng Rec 71:198 F 13 '15

ive years' experience with concrete pave-ments at Fredonia, Kansas. il Eng Rec 71: 530-1 Ap 24 '15

Pavements, Concrete—Continued

How to prevent the reflection of light and
heat from concrete pavements. il Munic Eng

How to prevent the reflection of fight and heat from concrete pavements, il Munic Eng 48:373-4 Je '15
Installation of Kahn armor plates, il diags Munic Eng 49:37-9 JI '15
Kinks in concrete road and pavement construction. C. D. Franks, il diags Eng & Contr 43:114-18 F 10 '15
Method of determining spacing of joints in concrete pavements or roads. H. J. Fixmer. Eng & Contr 43:407 My 5 '15
Method of striking off wide concrete street pavements and those having a varying crown. H. C. Campbell, diags Eng & Contr 44:69-70 JI 28 '15
Methods and costs of concrete pavement construction at Des Plaines, Illinois. M. P. Taylor. Eng & Contr 43:444-5 My 19 '15
Proportioning concrete; how Aberdeen secures use by contractors of proper amounts of cement and aggregate. L: D. Kelsey, Munic J 38:427 Ap '15; Same. Munic Eng 48:275
Ap '15; Same. Concrete Cem 7:144 O '15
Wood-block expansion joint for concrete alley pavements, diag Eng Rec 70:702 D 26 '14
See also Curbs, Concrete; Pavements, Bituminous concrete: Roads, Concrete

See also Curbs, Concrete; Pavements, Bituminous concrete; Roads, Concrete

### Cost

Average cost of concrete pavements laid in 1914. Eng N 73:941-2 My 13 '15 Cost of concrete pavements. C. H. Moorefield and J. T. Voshell. Eng & Contr 44:148 Ag

Cost of construction and maintenance of concrete roads. H. J. Kuelling. Concrete Cem 6:114-15 Mr '15

Methods and costs of concreting for modern pavement. S. Gausmann. Elec Ry J 45:718-19 Ap 10 '15; Same. Eng Rec 71:451, 534 Ap 10, 24 '15

## Maintenance and repair

Practical hints on proper methods of maintenance for concrete pavements. W. M. Kinney. il Eng Rec 70:633-4 D 12 '14 enovating a worn-out concrete pavement. il diag Eng N 73:172 Ja 28 '15 Renovating

il diag Eng N 73:172 Ja 28 '15

Pavements, Experimental

Experimental paving in Cleveland. M. B.

Greenough. Munic Eng 49:184 N '15

Experiments with wood paving blocks; eight years' test of seven species of wood and different angles of courses, conducted by U. S. forest service and city of Minneapolis. C. H.

Teesdale, diag Munic J 38:623-6 My 6 '15

Test results will form basis for selecting pavements in St. Louis. N. Cunliff. il Eng Rec 72:543-6 O 30 '15

Pavements, Granite
Bituminous filler for granite block in Brook-lyn. H. Schmidt, Eng Rec 71:297-8 Mr 6

'15
Durax pavement in Louisville. D. R. Lyman.
il Munic J 39:78 Jl 15 '15
Durax paving in Louisville, Kentucky, il
Good Roads n s 10:188 O 2 '15
Expansion joints in granite-block pavement.
il Eng N 74:398-9 Ag 26 '15
Granite-block crushing-test abandoned. Eng
N 74:809 O 21 '15
Granite block pavements. Eng N 73:403-4 F
25 '15

Cranite block repaying in Worcester, C. D. Pollock, il Munic J 39:541-3 O 7 '15

Joint fillers for granite block payements. C. D. Pollock, Munic J 39:777-8 N 18 '15; Excerpts. Good Roads n s 10:264 N 6 '15; Excerpts. Eng Rec 72:475 O 16 '15

Manufacture of granite paying blocks, il Eng N 73:376-81 F 25 '15

Methods and costs of grouting granite b pavement. Eng & Contr 44:350-1 N 3 '15

Mortar cushions for granite-block pavements. S. Whinery. Eng N 74:420 Ag 26 '15

Napped or recut granite paving in Baltimore; abstracts. R. M. Cooksey. Eng Rec 72:475 O 16 '15; Munic J 39:583-4 O 14 '15; Good Roads n s 10:267 N 6 '15

Pavements grouted at one application without separation of sand. D. Moomaw, Eng Rec 72:551-2 O 30 '15

Paving with redressed granite at Albany, N. Y. il Munic J 37:802-4 D 3 '14
Perfect condition of fourteen-year-old granite block paving. il Eng & Contr 44:192 S 8 '15
Recent practice in construction in wood and granite block. W: A. Howell. Good Roads n s 9:98-100 Mr 6 '15
Recut granite block pavements. W: A. Howell. Munic Eng 47:467-70 D '14; Same. Eng & Contr 42:358-60 O 14 '14
Redressed granite-block pavements. il Eng N 73:1020-3 My 27 '15
Relaying street railway tracks in an old

recuressed grante-block pavements. il Eng N 73:1020-3 My 27 '15
Relaying street railway tracks in an old granite block pavement in Worcester, Mass. il Good Roads n s 10:140 S 4 '15
Service tests of stone block pavements in Brooklyn, H. H. Schmidt. Eng & Contr 43: 158-9 F 17 '15

158-9 F 17 '15 Small granite block pavement. il Munic J 37: 799-800 D 3 '14 Small granite blocks laid on cement-sand cushion. il Eng Rec 72:329-30 S 11 '15 Track renewal discloses perfect condition of 14-year-old granite pavement in Worcester, Mass. il Eng Rec 72:229-30 Ag 21 '15

Pavements, Stone

Pavements with pitch filler, il Munic J 38: 160-2 F 4 '15

See also Pavements, Granite

Pavements, Tar concrete. See Pavements, Bituminous concrete

tuminous concrete

Pavements, Wood
American wood preservers' association; discussion. Elec Rv J 45:181-2 Ja 23 '15
Bleeding and swelling of paving blocks. C. H.
Teesdale. Eng & Contr 44:191 S 8 '15
Broad street wood block pavement, Newark,
N. J. Eng N 73:153 Ja 28 '15
Cement-sand bed best for wood-block paving.
C. R. Mandigo. Eng Rec 71:647-8 My 22 '15
Creosoted wood-block paving practice in St.
Paul, Minn. plan Eng N 73:879 My 6 '15
Douglas fir for paving blocks. O. P. M. Goss.
Eng N 74:774-6 O 21 '15
Dry sand and cement mixture vs. mortar bed

Eng N 74:774-6 O 21 '15
Dry sand and cement mixture vs. mortar bed for wood block pavements. T. S. Oxholm. Eng N 73:217 F 4 '15; Same. Munic J 38: 777 Je 3 '15
Experiences in creosoted wood block paving. E. R. Dutton. Good Roads n s 10:266-7 N 6 '15; Abstract. Eng Rec 72:475-6 O 16 '15
Experiments with wood paving blocks; eight years' test of seven species of wood and different angles of courses, conducted by U. S. forest service and city of Minneapolis. C. H. Teesdale. diag Munic J 38:623-6 My 6 '15

Laying creosoted wood-block on 5 per cent, grades, J. R. West, il Eng N 74:924-5 N 11

Lugs or spacers to prevent expansion failures in wood-block pavements. F. W. Cherrington. Eng N 73:275-6 F 11 '15
Pavement troubles along car tracks eliminated. Eng Rec 71:116 Ja 23 '15
Paving problems of Queensboro bridge, New York. il Eng N 74:396-7 Ag 26 '15
Popularity of wood-block paving in Great Britain. Sci Am 113:449 N 20 '15
Recent practice in construction in wood and granite block; with discussion. W: A. Howell. Good Roads n s 9:96-8, 100 Mr 6 '15
Test pavement of creosoted blocks at Kansas City. Eng Rec 71:86 Ja 16 '15
Tests vs. inspection of treatment of creosoted wood paving blocks. F. W. Cherrington. Munic Eng 48:120-1 F '15
Treated wood block pavement in the United States. Eng & Contr 43:365-7 Ap 21 '15
Treated wood block pavements. il Munic Eng 48:190 F '15
Use of wood block paving in the United Kingdow Good Book paving in the United Kingdom Gook Paving in Gook Paving in the United Kingdom Gook Paving in the United Kingdom Gook Paving in Gook Paving in Gook Paving in Great Paving in Gook Paving in Great Paving in Gook Paving i Lugs or spacers to prevent expansion failures

48:94-100 F '15
Use of wood block paving in the United Kingdom. Good Roads n s 10:234 O 23 '15
Value of the absorption test for wood blocks.
G: W. Tillson. Good Roads n s 9:191 My 1
'15: Same. Munic J 38:776-7 Je '15
Wood block and granite for bridge floors. E: A.
Byrne. il diags Munic Eng 48:337-9 Je '15

Wood block pavement after 6 years' service. il Eng Rec 71:53 Ja 9'15

Wood block pavement in the City of Wenat-chee, Wash. F. J. Sharkey. il Eng & Contr 44:300-2 O 20 '15

Pavements, Wood—Continued
Wood block pavement without cushion layer
of sand. il Eng Rec 71:52-3 Ja 9 '15
Wood block paving in Peoria, Illinois. L. D.
Jeffries. Good Roads n s 9:146 Ap 3 '15

Paving. See Pavements

Paving brick manufacturers, Institute of. See Institute of paving brick manufacturers

Paving machinery
Steam melting paving plant. il Munic J 37:
814 D 3 '14

Wonder paver, il Munic J 39:450 S 16 '15

Payrolls

Field and office methods employed by Louisville water co. in checking construction gang payrolls, G. D. Crain, jr. Eng & Contr 43:102-3 F 3 15

Peace

Organized efforts to bring about peace. F: W. Kelsey. Sci Am 111:491 D 12 '14 Plan for international peace. E. W. Sells. J Account 19:85-96 F '15

Pearl fisheries

Pearl fisheries of Ceylon. R. I. Geare. il Sci Am S 79:4-5 Ja 2 '15

Pearl harbor, Oahu island, Hawaiian islands

earl harbor dry dock; abstract. H. R. Stan-ford, Am Soc M E J 37:413-14 Jl '15

Pearl harbor drydock. F. R. Harris. Eng Rec 71:57-8 Ja 9 '15

Plan for building Pearl harbor drydock near Honolulu. il Eng Rec 71:82-4 Ja 16 '15; Eng N 73:86-9 Ja 14 '15

Pearls

Artificial production of pearls. F. E. Chidester. il Sci Am S 79:140 F 27 '15

See also Pearl fisheries

Pearson, Fred Stark, 1861-1915 In memoriam. por Gen Elec R 18:866, 930-3 S

assing of a great engineer—Dr. F. S. Pearson, H. P. Quick. Elec Ry J 45:988-9 My 22 '15; Same. Elec W 65:1287-8 My 22 '15 Passing

Sketch. Engineer 119:484-5 My 14 '15

Coal substitutes; use of chalk fuel and peat proposed in England. Sci Am S 79:352 My 29 15

Evaporation tests with peat and peat coke as fuels. H. Winkelmann. Am Soc M E J 37: fuels. H. V 289 My '15

Oils from peat; abstract. F. M. Perkin. Am Soc M E J 37:297-8 My '15

Russia's power resources; extensive water falls and peat deposits await exploitation. maps Eng M 49:909-12 S '15

Utilization of peat in Italy, Am Gas Light J 102:125 F 22 '15

Peat distillation

Apparatus for distillation of peat; patent by E. Eartholomew. diag Met & Chem Eng 13: 817 N 1 '15

Peat-distillation process. Elec R & W Elec'n 67:994 N 27 '15

Peking-Hankow railway Railways in China. Engineer 119:131-2, 197 F 5, 26 '15

Pellagra

Widening pellagra zone. Sci Am S 78:359 D 5-'14

Penetrometer

Testing apparatus for various tests of road materials. il Munic J 39:200 Ag 5 '15

Pennants

Outgrowths of letterpress. G: Sherman. il In-land Ptr 55:177-82 My '15

Pennsylvania

Bridges

Instructions to employees governing bridge work by Pennsylvania state highway depart-ment. Eng & Contr 43:32-3 Ja 13 '15

Highway department

Organization and standards of the Pennsylvania state highway department, il diags Eng & Contr 42:186-93 Ag 19 '14

Pennsylvania electric association 8th annual convention, Bedford Springs, Pa., Sept. 7-10, Elec R & W Elec'n 67:524-8 S 18 '15

th annual convention, Bedford Springs, Pa., Sept. 7-10. Elec W 66:661-2 S 18 '15

Pennsylvania railroad Annual report. Ry Age 58:394-6, 429-30 Mr 5

'15
Electrification of the Pennsylvania at Philadelphia. ii map Ry Age 59:889-94 N 12 '15
Electrification of the Pennsylvania railroad's suburban line at Philadelphia. il diags map Ry R 57:611-19 N 13 '15
Fire fighting on the Pennsylvania system. Ry R 57:559 O 30 '15
Norfolk & Western and Pennsylvania electrifications. G: Gibbs. W Soc E J 20:314-18 Ap '15

115

'16
Pennsylvania electrification at Philadelphia.
il Elec R & W Elec'n 67:923-8 N 20 '15
Pennsylvania electrification at Philadelphia.
il plan Elec W 66:1074-6 N 13 '15
Pennsylvania inaugurates electric service in
Philadelphia. il diag Eng Rec 72:590-3 N 13

'15
Pennsylvania R. R. electrifies Philadelphia district, il map Eng N 74:930-3 N 11 '15
Pennsylvania railroad test department. C. D. Young. il plan Ry Age (Mech ed) 89:332-7 Jl '15; Same. Ry Age 59:6-11 Jl 2 '15; Same. Ry R 57:2-5, 42-6, 117-18 Jl 3-10, 24 '15; Excerpts. Metal Ind n s 13:288-9 Jl '15
Pennsylvania track elevation through Wilkinsburg, Pa. il plans Ry Age 59:654-8 O 8

Philadelphia-Paoli electrification, il diags Elec Ry J 46:980-9 N 13 '15

Power distribution on Pennsylvania R. R. at Philadelphia, il plan Power 42:685-6 N 16 '15 Underground cable on the Pennsylvania rail-road, I. C. Forshee, il Ry Age 59:269-71 Ag 13 '15

Westinghouse electro-pneumatic air brake on the Pennsylvania railroad. H. T. Wade. il plan Sci Am 112:594 Je 12 '15

Pennsylvania state association of master plumb-

ers Annual convention, Wilkes-Barre, Pa., 18. Metal Work 83:777-9 My 28 '15 21st annual convention, Wilkes-Barre, May 18-19. Dom Eng 71:254-7 My 29 '1

Pennsylvania street railway association Spring meeting; workmen's compensation, or-ganized salety, small car operation and other topics discussed. Elec Ry J 45:935-6, 979-82 My 15-22 '15

Winter meeting, Dec. 8-9, 1914: abstracts of the reports and papers. Elec Ry J 44:1293-9 D 12 '14

Pennsylvania. University

Evans museum and dental institute, University of Pennsylvania, Philadelphia: designs and plans. Brickb 24:pl 46-9 Ap '15

Two dental buildings: Evans museum and dental institute, University of Pennsylvania. H. D. Eberlein. il plans Arch Rec 37:517-32 Je '15

Pensions

Baltimore's pension system. Elec Ry J 45:172-3 Ja 23 '15

Steel corporation pensions. Iron Age 95:268, 902 Ja 28, Ap 22 '15

Penstocks. See Water pipes

Peoria, Illinois Municipal steamboat landing at Peoria, Ill. diags plan Eng N 73:15 Ja 7 '15

John C. Proctor recreation center

John C. Proctor recreation center. il plans Arch Rec 37:116-31 F '15

## Streets

Wood block paving in Peoria, Ill. L. D. Jeffries, Good Roads n s 9:146 Ap 3 '15

Peptone Comparative study of methods for the quanti-tative determination of sulfur in peptone. H. W. Redfield and C. Huckle. Am Chem Soc J 37:607-11 Mr '15 Perceric oxide

Derivatives of perceric oxide. C. C. Meloche. diag Am Chem Soc J 37:2338-46 O '15

Pere Marquette railroad

Abstract of annual report. map Ry Age 59: 931-2 N 19 '15

Appraisal of the Pere Marquette lines in Michigan; abstract of a report to the rail-road commission. M. E. Cooley. Ry Age 58:

Appraisal of the Pere Marquette R. R. Ry R 56:68-9 Ja 9 '15

Appraisal report fills ten large boxes. il Eng Rec 71:200-2 F 13 '15

Perfumery
Contributions of the chemist to the perfumery and essential oil industry. E: T. Beiser.
J Ind & Eng Chem 7:936-7 N '15

Perfumery farming in the United States. Sci Am 112:212 Mr 6 '15

Rustic pergola for the country home, il diags Bldg Age 37:67 Je '15

Periodic law

Results of recent investigations. S. Dushman. Gen Elec R 18:614-21 Jl '15

Periodicals

Library files of periodicals, A. Fanti. Eng N 74:978 N 18 '15

See also Engineering periodicals; Newspapers

Periodides

Periodides of acid amides and their addition products with metallic salts; substances of exceptionally high molecular weight. F. J. Moore and R. M. Thomas. Am Chem Soc J 36:1928-37 S '14

Periscope Modern submarines in war and peace, S. Lake. Int Marine Eng 20:456 O '15

Periscope, the searching eye of the submarine, il Sci Am 112:96 Ja 30 '15

Scissors periscope. il Sci Am S 80:228 O 9 '15 Submarine periscopes. E. Coustet, il diags Sci Am S 80:269-70 O 23 '15; Abstract. Eng M 50: 110-11 O '15

Various forms of the periscope, diags Sci Am S  $79\!:\!322$  My 22 '15 Perishable freight association, American railway. See American railway perishable freight association

Perkin medal

Perkin medal; presentation to Edward Weston. Eng & Min J 99:234-5 Ja 30 '15

Perkin medal award to Edward Weston. Ind & Eng Chem 7:243-54 Mr '15

Presentation of the Perkin medal to Edward Weston. Met & Chem Eng 13:111-16 F '15

Permeameter Koepsel permeameter. C: W. Burrows, il diags U S Bur Stand Bul 11:101-30 N 15 '14; Ab-stract. Elec W 65:95-6 Ja 9 '15; Summary. Sci Am S 79:197 Mr 27 '15

of permutized water for processing ss. A. R. Calvo. Textile World 49:243-4+ Permutized water Value of yarns. A

My

Perry memorial Reinforced-concrete cap of Perry memorial column. H. C. Baird, diags Eng N 74:154-5 Jl 22 '15

Personal injuries Liability of machinery manufacturers. A. L. H. Street. Iron Age 95:222-3 Ja 21 '15

Personality Actual instances of dual personalities. E: T. Reichert. Sci Am S 79:2-3, 25-7 Ja 2-9 '15

Perspective Elementary perspective drawing, G: W. Kitt-redge, il Bldg Age 37:30-2 Ap; 31-3 My; 24-6 Je; 25-8 JI; 24-6 Ag; 35-8 S; 32-4 O; 39-40 N

Banking and credit in Argentina, Brazil, Chile, and Peru. E: N. Hurley. U S Bur For & Dom Com 90:1-72 '14

Financial developments in South American countries, W: H. Lough. U S Bur For & Dom Com 103:35-8 '15

See also Architecture-Peru

Industries and resources

Casapalca district, Peru. Eng & Min J 99:355 F 20 '15 Romantic story of vanadium, C. J. Stark, il Iron Tr R 57:781-4+ O 21 '15

Petroleum

etroleum

Analytical distillation of petroleum. W. F.

Rittman and E. W. Dean. diags J Ind &
Eng Chem 7:185-95, 754-60 Mr, S '15

Burning oil well and the well that extinguished itself. Sci Am S 80:343 N 27 '15

Burton process of cracking to make gasoline.
C. H. Claudy. il Sci Am 112:5+ Ja 2 '15

Capillary concentration of gas and oil. C. W.
Washburne. Am Inst Min E Bul 93:2365-78
S '14; Discussion. 100:831-46 Ap '15

Chlorides in oil-field waters. C. W. Washburne. Am Inst Min E Bul 87:375-81 Mr '14;
Discussion. 90:1374-5; 100:825-30 Je '14, Ap
'15

Crude oil as a reducing agent. Iron Tr R 56: 525-6 Mr 11 '15
Dehydrating oil plant of Nevada petroleum co., California. S. J. Hardison, il diags Am Inst Min E Bul 99:637-44 Mr '15
Dehydrating petroleum oil. diags Met & Chem Eng 13:570 S 1 '15
Estimation of aromatic hydrocarbons in cracked petroleum. W. F. Rittman, T. J. Twomey and G. Egloff. Met & Chem Eng 13:682-6 O 1 '15
Estimation of oil reserves. C. W. Washburne. Am Inst Min E Bul 98:469-71 F '15
Fluorescence of petroleum distillates. B: T. Brooks and R. F. Bacon. Sci Am S 79:61 Ja 23 '15

23 '15 Gas and oil wells through coal seams; discussion. Am Inst Min E Bul 100:846-58 Ap

'15
Improvement of high boiling petroleum oils, and the manufacture of gasoline as a byproduct therefrom, by the action of aluminum chloride. A. M. McAfee. J Ind & Eng Chem 7:737-41 S '15: Same. Met & Chem Eng 13:592-7 S 15 '15: Same abr. Am Gas Light J 103:293-5+ N 8 '15; Abstract. Eng N 74:532 S 16 '15
Increased gasoline yield and toluol from petroleum. Am Gas Light J 102:156-7 Mr 8 '15

Innovations in petroleum technology, Eng M 49:111-12 Ap '15

Iodine number of linseed and petroleum oils. W. H. Smith and J. B. Tuttle. U S Bur Stand Tech Pa. 37:1-17 '14; Same. J Ind & Eng Chem 6:994-8 D '14

Manufacture of gasoline by cracking heavy oils. Sci Am S 79:283 My 1 '15

Motor fuels; "cracked" spirits. V. B. Lewes. Am Gas Light J 103:179-81 S 20 '15

Oil, gas, and water content of Dakota s in Canada and United States. L. G. Hu ley. Am Inst Min E Bul 102:1333-53 Je Discussion. 108:2428-30 D '15 Hunt-Je '15;

Oil in an igneous rock, J. A. Udden. Econ Geol 10:582-5 S '15

Oils from peat; abstract. F. M. Perkin. Am Soc M E J 37:297-8 My '15

Petroleum developments. J: D. Northrop. Power 41:245 F 16 '15

Petroleum exhibit—San Francisco Panama-Pacific international exposition, February 20 to December 4, 1915. J Ind & Eng Chem 7:259-60 Mr '15

Preparation of gasoline and kerosene from heavier hydrocarbons. B: T. Brooks and others. diags J Ind & Eng Chem 7:180-5 Mr

Pressure distillation of petroleum hydro-carbons. A. P. Bjerregaard. il diags J Ind & Eng Chem 7:573-7 Jl '15

Range of applicability of the liquid sulphur dioxide method for determining aromatic constituents in hydrocarbon mixtures. W. F. Rittman and R. J. Moore. diag Met & Chem Eng 13:713-14 O 15 '15

Petroleum Continued
Relations among the physical constants of
the petroleum distillates. W. F. Rittman
and G. Egloff. J Ind & Eng Chem 7:578-82 15

J1 '15
Rittman process of cracking. C. H. Claudy. il Sci Am 112:267 Mr 20 '15
Rittman vaporizes petroleum in still. diag Automobile 32:555 Mr 25 '15
Rôle and fate of the connate water in oil and gas sands. R. H. Johnson. Am Inst Min E Bul 98:221-6 F '15: Discussion. 101: 1157-62; 103:1449-59; 105:2057-60 My, Jl, S '15

Temperature coefficient of expansion of petro-leum residuums. H. Rossbacher, diag J Ind & Eng Chem 7:577-8 Jl '15 Test plant operated to deodorize oil refinery wastes, F. R. Hesser, il diags Eng Rec 72: 541-2 O 30 '15

541-2 O 30 '15

Thermal reactions of petroleum hydrocarbons in the vapor phase, W. F. Rittman. J Ind & Eng Chem 7:945-53 N '15

Topping plants of California. A. F. L. Bell. il diags Am Inst Min E Bul 105:1769-99 S '15: Discussion. 108:2426 D '15

Variations of the physical characteristics of a petroleum residuum with increasing percentages of grahamite. H. Rossbacher. J Ind & Eng Chem 7:205-6 Mr '15

See also Coul. tar. products: Gast Gast Gast Oil:

See also Coal-tar products; Gas; Gas, Oil; Gasoline; Kerosene; Oil lands; Oil shales;

Oil storage

Bibliography

Bibliography of the chemistry of gas manufacture. W. F. Rittman and M. C. Whitaker. U S Bur Mines Tech Pa 120:11-12 '15

#### Cost

Cost of maintaining production in California oil fields, M. E. Lombardi, Am Inst Min E Bul 105:2109-14 S '15; Discussion, 108:2427 D

Laws and regulations

Regulation of oil and gas wells in California.
L: H. Eddy. Eng & Min J 100:383-4 S 4
'15

Transportation

See Petroleum pipe lines; Tank cars; Tank

## Well boring

Comparative costs of rotary and standard drilling. M. L. Requa. Am Inst Min E Bul 98:217-19 F '15
Drilling for oil. Sei Am S 80:199 S 25 '15
Evolution of drilling rigs. R. B. Woodworth. il diags Am Inst Min E Bul 107:2247-312 N

Geologic conditions that may confuse oil drillers, D. Hager, il Eng & Min J 100:590

Improved methods of deep drilling in the Coalinga oil field, California. M. E. Lombardi, il diag Am Inst Min E Bul 98:209-15

rotecting California oil fields from damage by infiltrating water. R. P. McLaughlin. diag Am Inst Min E Bul 108:2313-19; Dis-cussion. 2413-19 D '15 Protecting

Petroleum fields of Alaska. A. H. Broc maps Am Inst Min E Bul 98:199-207 F Brooks.

## Alberta

Correlation and geological structure of the Alberta oil fields, D. B. Dowling, map Am Inst Min E Bul 102:1355-64 Je '15

#### California

California oil in 1914. M. L. Requa. Eng & Min J 99:139-40 Ja 16 '15

Min J 99:139-40 Ja 16 '15
California petroleum production, first half of 1915. Eng & Min J 100:238 Ag 7 '15
Cost of maintaining production in California oil fields. M. E. Lombardi. Am Inst Min E Bul 105:2109-14 S '15; Discussion. 108:2427 D '15

Protecting California oil fields from damage by infiltrating water. R. P. McLaughlin. diag Am Inst Min E Bul 108:2313-19; Dis-cussiom. 2413-19 D '15

Chile

Petroleum prospects in Chile. Sci Am S 80: 48 Jl 17 '15

Galician oil fields in war time. J. R. Falkowicz. Eng & Min J 99:690 Ap 17'15

Illinois

Illinois oil in 1914. R. S. Blatchley. Eng & Min J 99:136-7 Ja 16 '15

Kentucky

Oil and gas possibilities of Kentucky, F. J. Fohs, map Am Inst Min E Bul 99:621-8 Mr

Louisiana

Petroleum in Texas and Louisiana. A. J. Haz-lett. Eng & Min J 99:137-9 Ja 16 '15

Mexico

Furbero oil field, Mexico. E. Degolyer. il map Am Inst Min E Bul 105:1899-1911 S '15 Mexican oil fields. L. G. Huntley. il maps Am Inst Min E Bul 105:2067-107 S '15 Occurrences of petroleum in eastern Mexico as contrasted with those in Texas and Loui-siana. E. T. Dumble. Am Inst Min E Bul 104:1623-38 Ag '15; Discussion. 108:2434-5 D

Oil fields of Mexico. E. Ordoñez. Am Inst Min E Bul 94:2531-5 O '14; Discussion. 100:817-23 Ap '15

Oil region of northeastern Mexico. V. R. Gar-fias. bibliog Econ Geol 10:195-224 Ap '15

Mississippi

Probable oil pools in Mississippi. Am Gas Light J 103:183 S 20 '15

Montana

Probable oil and gas in Montana, J. P. Rowe, Eng & Min J 99:647-9 Ap 10 '15

Oklahoma

Influence of the Cushing pool in the oil industry. R. H. Johnson and L. G. Huntley-Eng Soc W Pa 31:460-72; Discussion. 31:472-87 Jl '15

Oil pools of southern Oklahoma and northern Texas. J. H. Gardner. maps Econ Geol 10: 422-34 Jl '15

Texas

Occurrences of petroleum in eastern Mexico as contrasted with those in Texas and Louisiana. E. T. Dumble. Am Inst Min E Bul 104:1623-38 Ag '15
Oil pools of southern Oklahoma and northern Texas. J. H. Gardner, maps Econ Geol 10: 422-34 Jl '15
Petroleum in Texas and Louisiana. A. J. Hazlett, Eng & Min J 99:137-9 Ja 16 '15

United States

Petroleum in the United States in 1914. Eng & Min J 99:69 Ja 9 '15

Washington

Possible occurrence of oil and gas fields in Washington. C; E. Weaver, Am Inst Min E Bul 103:1419-27 Jl '15; Discussion. 108:2431-3

Petroleum, Synthetic
Gasoline from synthetic crude oil. W. O. Snelling. Am Inst Min E Bul 100:695-704 Ap '15;
Same. Sci Am S 79:189-91 Mr 20 '15; Same cond. Sci Am 112:266-7 Mr 20 '15; Abstract.
Met & Chem Eng 13:180-1 Mr '15; Discussion. Am Inst Min E Bul 101:1163-9 My '15
Gasoline from synthetic oil. W. O. Snelling.
Eng & Min J 99:379 F 20 '15; Same. Am Gas
Light J 102:156 Mr 8 '15

Petroleum as fuel

Air and steam as atomizing agents. R. A. Bull. diags Iron Tr R 57:626-9 S 80 '15; Same. (Tests in atomizing fuel oil with steam and air). Foundry 43:424-7 O '15; Excerpts. Iron Age 96:1049-50 N 4 '15

Age 96:1949-50 N 4 15 Auxiliary steam plant of the Vancouver Island power company. H. W. Beecher. il plans Elec R & W Elec'n 67:373-8 Ag 28 '15 Comparative furnace efficiency. R. J. Weit-laner. Met & Chem Eng 13:357-61 Je '15

Petroleum as fuel -Continued

Comparison of the economy of powdered coal, oil and water gas for heating furnaces. C. F. Herington. Eng N 72:1156-8 D 10 '14 Crude oil as fuel in heating systems. H. S. Haley. diags Dom Eng 70:104-6, 139-41 Ja 23-30 '15

Description of nut, bolt and rivet shop of Upson nut co, with details of arrangement and equipment. R. V. Sawhill. Iron 'Tr R 56: 1249-51 Je 17'15

Difficulties accompanying the prevention of dense black smoke and its relation to the cost of fuel and locomotive repairs; report. Ry R 57:337-8 S 11'15

Fuel oil. Sci Am S 79:325 My 22'15

Fuel oil for locomotives. G. M. Bean. diags Ry R 56:752-6 Je 5'15; Same cond. Power 41; 900-1 Je 29'15; Same cond. Ry Age (Mech ed) 89:280-1 Je '15; Same cond. Ry Age 58: 1115-16 My 28'15; Same cond. Sci Am 113: 92 Jl 31'15

Fuel oil in the navy. Sci Am S 79:218 Ap 3

Fuel oil installations on the Grand Trunk Pacific Ry. J. G. LeGrand, diags Ry R 56:828-31 Je 19 '15 Fuel oil on railroads, Sci Am S 79:203 Mr 27

Largest oil-burning steamers. Sci Am 113:361 Lead smelting at El Paso. H. F. Easter. Am Inst Min E Bul 104:1493-1506 Ag '15; Ex-cerpts. Eng & Min J 100:356-7 Ag 28 '15 Liquid fuel for foundry cupolas. E. F. Cone-diag Iron Age 95:1058-9 My 13 '15 Liquid fuel for melting. Iron Tr R 57:222-3 Jl

29 '15
Low-pressure oil-burning metallurgical furnaces, il Met & Chem Eng 13:510-11 Ag '15
Motor fuels; situation in England, and on the continent. V. B. Lewes. Am Gas Light J 103: 165-7, 170-1, 179-81 S 20 '15
Oil-burning stand-by plants. C. H. Delany. Power 42:172-5 Ag 3 '15; Abstract. Elec W 65:1514 Je 12 '15
Oil firing in foundry practice. W. N. Best

65:1514 Je 12 '15
Oil firing in foundry practice. W. N. Best. Iron Age 95:870-1 Ap 15 '15
Petroleum as fuel under boilers and in furnaces for heating, melting, and heat treatment of metals. W. N. Best. il diags Am Inst Min E Bul 104:1527-37 Ag '15; Discussion. 108:2420-2 D '15
Possible savings with oil fuel. Old Scotch. Int Marine Eng 20:81 F '15
Reverberatory smelting practice of Nevada consolidated copper co. Met & Chem Eng 13:

Roasting and leaching concentrator slimes tailings. L. Addicks. Am Inst Min E Bul 104: 1477-8 Ag '15; Same. Met & Chem Eng 13: 533 S 1 '15

Test of Mexican fuel oil. Ind Eng 15:29 Ja

See also Gas and oil engines

Petroleum engines. See Gas and oil engines

Petroleum industry
Depreciation as applied to oil properties. P. W.
Henry. Am Inst Min E Bul 97:23-30 Ja '15;
Discussion. 101:1148-51 My '15
Influence of the Cushing pool in the oil industry. R. H. Johnson and L. G. Huntley.
Eng Soc W Pa 31:460-72; Discussion. 31:47287 Jl '15
1914 oil product. Am Gas Light J 103:59 Jl 26

Oil production a record breaker, Am Gas Light J 102:43-4 Ja 18 '15 Sliding royalties for oil and gas wells. R. H. Johnson, Am Inst Min E Bul 102:1292-4 Je '15; Discussion, 108:2423-5 D '15 World's production of petroleum in 1914, Am Gas Light J 103:123 Ag 23 '15

Petroleum pipe lines California oil pipe line, 200 miles long, built in record time of 15 months. il map Eng Rec 72:294-6 S 4 '15

Pumping California crude oil. C. P. Bowie. il Eng N 74:1068-71 D 2 '15

Pharmaceutical chemistry.

Medical and pharmaceutical Chemistry.

Pharmacy

See also Drugs-Analysis

Phase advancers

Action of phase advancer in regulating power-factor of an induction motor, diag Elec W 66:191 Jl 24 '15 Methods of testing the Scherbius compensa-tor, A. A. Ahmed, Inst E E J 53:640-8 My 1

Phenacetin

Estimation of phenacetin and salol in admix-ture. W. O. Emery, G. C. Spencer and C. C. LeFebvre. J Ind & Eng Chem 7:681-4 Ag '15

Phenol. See Carbolic acid

Phenolates

Study of the reaction of alkali salts of sulfonic acids with alkali phenolates by dry distilla-tion. E. H. Nollau and L. C. Daniels. Am Chem Soc J 36:1885-91 S '14

Phenolquinolinein

Phenolquinolinein, a heterocyclic analog of phenolphthalein. A. W. Dox. Am Chem Soc J 37:1948-9 Ag '15

Phenylcytosine

Researches on pyrimidines: synthesis of 4-phenylcytosine. T. B. Johnson and E. H. Hemingway. Am Chem Soc J 37:378-83 F '15

Philadelphia, Pennsylvania Comprehensive city planning in Philadelphia. B. A. Haldeman. il Am Inst Arch J 3:255-60 Je '15

#### Architecture

Architectural reclamation of small areas in cities. H. D. Eberlein, il Arch Rec 37:1-25 Ja '15

Ja '15 New building for the T-square club, Phila-delphia, Pa. J: F. Harbeson, il plans Brickb 24:253-4 O '15

hree types of Georgian architecture: the evolution of the style in Philadelphia. H. D. Eberlein, il diags Arch Rec 37:159-76 F '15

Bridges

Better looking city railway bridges in Phila-delphia. M. L. Cooke. Eng N 74:682 O 7 '15

Street bridges in Philadelphia designed for permanent artistic effects, il diags Eng Rec 72:598-600 N 13 '15

Bureau of highways

Cost keeping system for work performed by municipal forces of the Philadelphia bureau of highways. Eng & Contr 43:292-4 Mr 31 '15; Same cond. Eng Rec 71:360-1 Mr 20 '15

Functions of the planning boards installed in the Bureau of highways and street cleaning. W: H. Connell. Eng & Contr 4:187 S 8 '15; Same. Good Roads n s 10:168 S 11 '15

1914 operations of the Philadelphia bureau of highways and street cleaning. il Good Roads n s 9:131-5 Ap 3 '15

rganization, character of personnel, scope of work, and methods of operation and control of a large municipal highway department. W: H. Connell. il map J Fr Inst 179: 439-69 Ap '15 Organization,

#### Electrical bureau

Signal box records. P. I. Patton, Munic J 39: 397-8 S 9 '15

# Public works

Pertinent paragraphs from a real report. M. L. Cooke. il Eng M 50:445-9 D '15

### Railroads

Electrification of the Pennsylvania railroad's suburban line at Philadelphia, il diags map Ry R 57:611-19 N 13 '15
Pennsylvania R. R. electrifies Philadelphia district, il map Eng N 74:930-3 N 11 '15

Philadelphia-Paoli electrification. il diags Elec Ry J 46:980-9 N 13 '15

\$24,000,000 South Philadelphia railroad im-provement now well under way. il map Eng Rec 72:327-9 S 11 '15

Rapid transit

City of Philadelphia starts rapid-transit work. H: H. Quimby, Eng N 74:572-3 S 16 '15

Second Philadelphia report issued. Elec Ry J 46:663 O 2 '15

### Philadelphia, Pennsylvania - Continued

#### Sewerage

Sewerage

Collection and treatment of sewage. G: S.
Webster. Boston Soc C E J 1:277-89 My '14

Collection and treatment of sewage in Philadelphia. Eng & Contr 12:205-7 Ag 26 '14

Final report on Philadelphia's plan of sewage treatment. Eng Rec 71:638 My 22 '15

Philadelphia sewage treatment report. Munic J 38:840-2 Je 17 '15

Philadelphia's sewerage report; editorial comment. Munic J 39:257-9 Ag 19 '15

Sewerage developments at Philadelphia. Eng & Contr 43:sup20 My 26 '15 G:, 5

#### Streets

Streets

Dust suppression and street cleaning. W: H.
Connell. Good Roads n s 10:249-52 N 6 '15;
Same abr. Eng & Contr 44:238-42 S 29 '15

Philadelphia highway work; use of granite
block in street railway tracks and wood
block near schools and hospitals. il Munic
J 38:619-22 My 6 '15

Road and boulevard construction in Philadelphia. il map Munic Eng 48:243-8 Ap '15
Rules and regulations governing street traffic
in Philadelphia. il diags Eng & Contr 42:
321-4 S 30 '14

See also Philadelphia-Bureau of highways

#### Water supply

Water supply

New sedimentation basin will halve costs of sand cleaning at Philadelphia filters, F, D, West, diags Eng Rec 71:591-3 My 8 '15

Philadelphia water-filter operations in 1914. Eng N 73:576-7 Mr 25 '15

Philadelphia water-works handicap: 1804-1914. J: C. Trautwine, jr. Eng N 73:900-1 My 6 '15

Philadelphia water-works in 1914. Eng N 73: 506 Mr 11 '15

Results of task work without bonus in cleaning filter sand at Philadelphia. S, E. Thompson. Eng Rec 70:608-9 D 5 '14; Same Eng & Contr 42:579-81 D 23 '14; Same cond., with discussion. Am Soc M E J 37:102-4 F '15; Same cond. (Efficiency study of filter cleaning) Munic J 38:253-4 F 25 '15

## Wharves

Philadelphia's Southwark piers completed. il diags plans Eng Rec 72:478-80 O 16 '15

Shipping piers in Southwark district of Philadelphia, il diags plans Eng N 74:421-4 Ag 26'15

## Philippine islands

# Commerce

Philippine markets for American lumber, F. H. Smith, U S Bur For & Dom Com 100:1-16 '15

### Industries and resources

Gold dredging in the Philippines, il Eng & Min J 99:685-8 Ap 17 '15

Philippine forest wealth. D. C. Worcester. il Am For 21:1-18 Ja '15

Rattan supply of the Philippines. J: R. Arnold. U S Bur For & Dom Com 95:1-40 '15

## Law

United States mining statutes annotated. J. W. Thompson, U S Bur Mines Bul 94:pt 2, 1053-67 '15

#### Public works

Philippine road built at high level to escape flood damage, il map Eng Rec 72:264-6 Ag 28 '15

**Phonetics** Visible speech; eye seeing and the rule meas-uring the difference between sounds. A. L. Kroeber, il diags Sci Am 112:471 My 22'15

Phonograph
Electrically operated phonograph. il diag Elec
W 65:1480 Je 5 '15

Microscopic study of the phonograph. J. B. Taylor, il Sci Am 113:428-9+ N 13 '15

Phonograph diaphragm operating on magnetic principles and adaptable to telephone circuits, il diag Elec W 66:1161 N 20 '15

Phonograph shop. See Edison phonograph shop Phonology. See Phonetics

Phonopticon

Mechanical eye bringing sight to the blind. L. E. Dodd, il Sci Am 113:138+ Ag 14 '15 Phonoptikon and the optophone. E. E. Four-nier d'Albe, Sci Am 113:467 N 27 '15

Phosphate lands

United States mining statutes annotated. J. W. Thompson, U.S. Bur Mines Bul 94:pt 2, 1050-2 15

Phosphates

hosphates

Formation of tri-calcium phosphate on mixing ground limestone with acid phosphate. R. N. Brackett and B: Freeman. J Ind & Eng Chem 7:620 Jl '15

Newly discovered phosphate deposit in Tennessee. H: V. Maxwell. Eng & Min J 99:1110-

Newly discovered phosphate deposit in Fearnessee, H; V. Maxwell, Eng & Min J 99:1110-11 Je 26 '15
Phosphate rock as furnace flux, J. A. Barr, il Iron Tr R 56:183-5 Ja 21 '15
Phosphate rock industry of Florida, L, W. Tucker, il Boston Soc C E J 1:509-22 D '14
Phosphates of 2,3-distearin, R. R. Renshaw and R. R. Stevens, Am Chem Soc J 36:1770-2 Ag '14
Penort of the committee of American chemical

Report of the committee of American chemical society on research and analytical methods—phosphate rock. J Ind & Eng Chem 7:446-8 My '15

# Phosphor-bronze. See Bronze

#### Phosphorescence

hosphorescence
Experiments on the nature of the photogenic processes in the lampyridae. F. A. McDermott. Am Chem Soc J 37:401-4 F '15
Experiments on the nature of the photogenic substance in the firefly. E. N. Harvey. diag Am Chem Soc J 37:396-401 F '15
Production of light by animals. U. Dahlgren. il J Fr Inst 180:513-37, 711-27 N-D '15 (to be cont)

### Phosphoric acid

Rosphoric acid
Comparison of a few methods for total phosphoric acid in superphosphate. C. A. Peters. J Ind & Eng Chem 7:39-40 Ja '15
Factor to be used for the calculation of the phosphoric acid in Neumann's method. S. L. Jodidi. Am Chem Soc J 37:1708-10 Jl '15
Factor to be used for the calculation of the phosphoric acid in Neumann's method. S. L. Jodidi and E. H. Kellogg. J Fr Inst 180: 349-67 S '15
Strongth of Sittle 180.

Strength of nitric acid, period of extraction, and ignition as affecting the gravimetric determination of phosphoric acid in soils. O. L. Brauer. J Ind & Eng Chem 6:1004-5 D '14

#### Phosphorus

Analoid method for the determination of phosphorus in steel, iron and slag. Met & Chem Eng 13:191-2 Mr '15

Colorimetric determination of phosphorus in soil extracts. C. E. Millar and F. A. Gangler. J Ind & Eng Chem 7:619 JI '15

Estimation of uranium and phosphorus, H. D. Newton and J. L. Hughes. Am Chem Soc J 37:1711-15 Jl '15

Factor to be used for the calculation of phosphoric acid in Neumann's method. S Jodidi. Am Chem Soc J 37:1708-10 Jl '15

How to detect phosphorus in steel. Stead. il Iron Tr R 57:989-90 N 18 '15

Nephelometric estimation of phosphorus. P. A. Kober and G. Egerer. Am Chem Soc J 37: 2373-81 O '15

Phosphorus in malleable castings. E. Touceda. il Iron Tr R 57:634-6 S 30 '15; Same. Foundry 43:446-9 N '15; Same cond. Iron Age 96: 924-6 O 21 '15

Precipitation of phosphorus as ammonium phosphomolybdate in the presence of sulfuric acid. K. G: Falk and K. Sugiura. Am Chem Soc J 37:1507-15 Je '15

Phosphorus pentachloride

Densities and degrees of dissociation of the saturated vapor of phosphorus pentachloride. A. Smith and R. H. Lombard, diags Am Chem Soc J 37:2055-62 S '15

Photochemistry
Features of photo-chemistry. H. H. McHenry.
Sci Am S 79:27 Ja 9 '15

See also Photographic chemistry

Photo-electric cells

Potassium photo-electric cells; a study of the relationship of illumination and current. H. E. Ives. diags Sci Am S 80:348-50, 362-3 N 27-10 4 '15

ero method with photo-electric cells; ab-stract. F. K. Richtmyer, plan Elec W 66: 252 Jl 31 '15

Photo-electricity Photoelectric relay. J. Kunz. diag Elec W 66:

Photo-electricity; the intimate relations of light and electricity. J. A. Fleming. Sci Am S 80:6-7, 18-19 Jl 3-10 '15

Photoengraving

Development and recent advances of the techno-graphic arts. L; E; Levy. il J Fr Inst 180:387-408 O '15 Standardization of the trimming of blocks for engravings. F. W. Gage. il Inland Ptr 55: 246-9 My '15

### Cost

Increase in prices for engravings. Inland Ptr  $55{:}769{-}70~\mathrm{S}$   $^{\prime}15$ 

Photogenic process. See Phosphorescence

Photographic chemistry

Contributions of the chemist to the photo-graphic industry. F. C. Frary. J Ind & Eng Chem 7:938-9 N '15

Chem 7:938-9 N '15
Evolution of the modern dry plate; its history, chemistry and manufacture. E. P. Wrightman. Sci Am S 80:126-7 Ag 21 '15
Hydrogen potentials of sodium hydroxide solutions and the dissociation constant of water. F. C. Frary and A. H. Nietz. Am Chem Soc J 37:2263-8 O '15
Hydrolysis of sodium carbonate in solution. F. C. Frary and A. H. Nietz. Am Chem Soc J 37:2268-73 O '15

Reaction between alkalies and metol and hy drochinon in photographic developers. F. C. Frary and A. H. Nietz. Am Chem Soc J 37:2273-9 O '15

37:2273-9 O '15
Reducing power of photographic developers as measured by their single potentials. F. C. Frary and A. H. Nietz. diags Am Chem Soc J 37:2246-63 O '15
Removal of photographic developing and fixing agents from films and prints. C. A. Brautlecht. J Ind & Eng Chem 7:899 O '15

Photographic paper
Diffusing media; the optical properties of photographic papers. Illum Eng Soc 10:388-93 no

Japanese tissue as a photographic paper. Sci Am 113:299 O 2 '15 Photographic paper to be made in America. Sci Am 113:248 S 18 '15

**Photographs** Nine photographs by Ben J. Lubschez. Am Inst Arch J 3:380a-380h S '15

Application of the new high-efficiency tungsten lamp to photography; with discussion.

M. Luckiesh. il Illum Eng Soc 10:149-80 no Photography

Artificial illuminants for use in practical photography, C. E. K. Mees. J Fr Inst 180:

Development and recent advances of the techno-graphic arts. L; E: Levy. il J Fr Inst 180:387-408 O '15
Evolution of the modern dry plate; its history, chemistry and manufacture. E. P. Wrightman. Sci Am S 80:126-7 Ag 21 '15
Cos filled lamp in photography. Elec. W 65:

man. Sci Am S 80:126-7 Ag 21 '15
Gas-filled lamp in photography. Elec W 65:
1154-5 My 8 '15
How to make carbon positives. C. C. Kiplinger. Sci Am 112:289 Mr 27 '15
Invention and development of photography;
from the daguerreotype to the moving picture. il Sci Am 112:530+ Je 5 '15
Making good photographs. Sci Am S 80:266-7
O 23 '15
With regard filled tungsten lamp for photographic

Nitrogen-filled tungsten lamp for photographic purposes; abstract. W. Voege, Elec W 65: 1116-17 My 1 '15

Physics of the photographic process, C. E. K. Mees, diags J Fr Inst 179:141-60 F '15; Ab-stract. Met & Chem Eng 13:923 D 1 '15

Possibilities in technical photography. I nius. Eng Soc W Pa 30:991-1002 Ja '15

Recent advances in photography. H: Leff-mann, il J Fr Inst 178:743-9 D '14; Same, Sci Am S 79:44-5 Ja 16 '15 Relative photographic and visual efficiencies of illuminants, L. A. Jones, M. B. Hodgson and K. Huse, J Fr Inst 180:484-7 O '15

and R. rigge. 3 Ff rinst 1804-140-140 in Sec also Blue prints; Cameras; Chronophotography; Color photography; Moving pictures; Photographic paper; Photographs; Photodeleidograph; Photomicrography; Phototelegraphy; Radiography; Stereoscopic totelegraphy; Radiography

## Reproduction of plans, drawings, etc.

Reproduction of plans, drawings, etc.
Camera vs. the pantograph. H. A. Williamson, diags Colliery 35:288-91 Ja '15; Excerpt. Eng M 48:901-3 Mr '15
How tracings are reproduced for the federal evaluation. Eng Rec 71:675 My 29 '15
Machine reproduces, develops and prints all in itself. il Eng Rec 72:32 Jl 3 '15
New reproducing machine of the Commercial camera co. il Iron Tr R 56:1106-7 Je 3 '15
Photographing on both sides of a sheet. il Iron Age 95:1122-3 My 20 '15
Photostat and its use. L. D. Burlingame. il Mach 21:951-4 Ag '15
Portland, Ore., bureau of photography. H. M. White. il Munic J 39:577-8 O 14 '15

Photography, Aerial

Military rocket camera. il Sci Am 112:125 F

Photographic maps; methods of producing correct charts with the camera. Kappel. il diags Sci Am S 80:200-1 S 25 '15

Photography, Bureaus of See Portland, Ore-gon—Bureau of photography

Photography, Color. See Color photography

Military air scouting by motion pictures. E. A. Dench. Sci Am 112:156 F 13 '15 Military rocket camera. il Scr Am 112:125 Deno. Military 6 '15

See also Photography of projectiles

Photography, Submarine
Submarine photographic apparatus, il Elec W
65:1330-1 My 22 '15

Submarine photography, il Int Marine Eng 20:327 Jl '15

Submarine photography. J. E. Williamson, Il Illum Eng Soc 10:403-4 no 5 '15

Submarine photography by aid of quan-lamps, il Elec R & W Elec'n 66:1009 My '15

Photography in industry

See also Photography—Reproduction plans, drawings, etc.

Photography of projectiles Photographing projectile hotographing projectiles. C. Cranz, P. A. Günther, and F. Külp. il Sci Am S 79:204-5, 220-1 Mr 27-Ap 3 '15

Photography of sound Photographing speech; some recent investiga-tions by Dr. Marage. J. Boyer. il Sci Am 112:607-8 Je 19 '15

Photokaleidograph
Apparatus for the production of kaleidoscopic
pictures. il Sci Am S 79:12-13 Ja 2 '15 Photo-kaleidograph. il Sci Am 112:103 Ja 30

Photometric analysis. See Nephelometry (photometric analysis) Photometry

Approximate uniform photometric point-source. A. E. Kennelly, R. W. Chadbourn and G. D. Edwards. diags Illum Eng Soc 10: 126-33 no 1 '15

method developed to overcome the difficulties encountered with indirect or semi-direct light sources. R: C. Powell. Elec W 65:1463-4 Je 5 '15 Calculation of illumination; description

Characteristic equations of tungsten filament lamps and their application in heterochromatic photometry, G. W. Middlekauff and J. F. Skogland, U. S. Bur Stand Bul 11:483-534 My 27 '15; Abstract, J. Fr. Inst. 179:97-9 Ja '15; Excerpt, Illum Eng Soc 9:734-68; Discussion, 9:769-74 no 8 '14

Photometry—Continued
Choice of a group of observers for heterochromatic measurements. H. E. Iyes and
E. F. Kingsbury, Illum Eng Soc 10:203-8 no

3 '15
Establishment of photometry on a physical basis, H. E. Ives, bibliog il diags J Fr Inst 180:409-36 O '15
Experiments with colored absorbing solutions for use in heterochromatic photometry; with discussion. H. E. Ives and E. F. Kingsbury, diags Illum Eng Soc 9:795-813 no 8 '14; 10:253-8 no 3 '15
Flicker photometer attachment for the Lummer-Brodhun contrast photometer. E. F. Kingsbury, il diags J Fr Inst 10:215-23 Ag '15; Same. Am Gas Light J 103:119, 122-3 Ag 23 '15
Home-made portable equipment for photom-

Ag 23 '15

Home-made portable equipment for photometer tests, il Elec W 66:873 O 16 '15

Integrating sphere and arc lamp photometry; with discussion, N. K. Chanev and E. L. Clark, Illum Eng Soc 10:1-37 no 1 '15

Integrating sphere equipped for testing gas-filled lamps, il diag Elec W 65:120 Ja 9 '15

Light filters for use in photometry; with discussion, C. E. K. Mees, Illum Eng Soc 9: 990-7 no 9 '14

Method of correcting abnormal color vision and its application to the flicker photometer.

Method of correcting abnormal color vision and its application to the flicker photometer. H. E. Ives and E. F. Kingsbury. Illum Eng Soc 10:259-70 no 3 '15

Methods of expressing brightness. J. R. Cravath. Elec W 64:1157-8 D 12 '14

New form of flicker photometer. Illum Engr 8:462 N '15

New form of flicker photometer, fluin Englishes N '15

New illumination photometer, C. S. Redding, il diag Elec W 65:85-6 Ja 9 '15; Elec R & W Elec'n 66:220-1 Ja 30 '15

New illuminometer, Elec W 65:74 Ja 9 '15

New standard light source, L. A. Jones, Am Gas Light J 101:251-3 O 19 '14; Same, Illum Eng Soc 9:716-27; Discussion, 9:728-33 no

Se '14 Optical properties of diffusing media. Illum Eng Soc 10:366-78 no 5 '15 Ornamental street-lighting systems compared. H. E. Mahan and H. E. Butler. il diags Elec W 66:180-2 Jl 24 '15 Photometric units. P. G. Nutting. Elec W 65: 332-3, 645 F 6, Mr 13 '15 Photometry of gas-filled incandescent lamps; with discussion. C. H. Sharp. il Illum Eng Soc 9:1021-32 no 9 '14 Photometry of gas-filled lamps. D. H. Tuck. diags Elec W 65:78 Ja 9 '15 Photometry of incandescent lamps. J. W. Roper. diags Am Gas Light J 102:178-9 Mr 22 '15

Photometry of lights of different colors; abstract. I. G. Priest. Elec W 66:185 Jl 24 '15 Photometry of the gas-filled lamp. G. W. Middlekauff and J. F. Skogland. Elec W 64: 1248-51 D 26 '14 Physical photometer in theory and practice. W. W. Coblentz. diags J Fr Inst 180:335-48

W. V S'15

S 15 Physical photometry, H. E. Ives, diags Illum Eng Soc 10:101-25 no 1 '15 Physical photometry with a thermopile arti-ficial eye; abstract. H. E. Ives and E. F. Kingsbury, diag Elec W 66:1100-1 N 13 '15

Potassium photo-electric cells; a study of the relationship of illumination and current. H. E. Ives. diags Sci Am S 80:348-50, 362-3 N 27-D 4 '15

Practical rating of electric incandescent lamps; with discussion. F. W. Willcox. diags Illum Engr 8:163-85 Ap '15

Progress in photometry; committee report. Illum Eng Soc 10:550-6 no 7 '15; Same cond. Am Gas Light J 103:278 N 1 '15

Proposals relative to definitions, standards and photometric methods. H. E. Ives. bibliog Illum Eng Soc 10:315-19 no 4 '15

Proposed unit of brightness. Elec W 65:715 Mr 20 '15 Mr 20

Rapid illuminometer exhibited before Chicago section, I. E. S. diag Elec W 65:170-1 Ja 16

Transmission and reflection photometer for small areas. P. G. Nutting and L. A. Jones, plan Illum Eng Soc 9:611-13 no 7 '14

Unit of brightness. H. E. Ives. Elec W 65:460 F 20 '15
Year's progress in illuminating engineering. Illum Engr 8:45-7 F '15
Zero method with photo-electric cells; abstract, F. K. Richtmyer, plan Elec W 66:252 ero ... stract. F.

Ji 31 '15

Photomicrography
Equipment for sand photomicrography, il Eng N 74:240 Jl 29 '15

Improved applaratus for photomicrography of metals, il Met & Chem Eng 13:928-9 D 1 '15

Mechanical features of the hydration of Portland cement and the making of concrete as revealed by microscopic study, N. 'C, Johnson, in Am Soc M E J 37:516-25; Discussion, 37:525-8 S '15

Microscope opens new field in study of con-

Microscope opens new field in study of concrete, N. C. Johnson, il Eng Rec 71:98-102, 160-4, 194-7, 263-5, 301-3, 320-4 Ja 23, F 6-13, 27-Mr 13 '15

27-Mr 13 '15
Portraying the little things of nature. E: F.
Bigelow, il Sci Am 113:360 O 23 '15
Shells from European battlefields, il Iron Age
96:186-7 Jl 22 '15
Use of light filters with the tassin metallographic apparatus. F: H., Getman, il diag J
Ind & Eng Chem 7:431 My '15

Photostat

New reproducing machine. il Iron Tr R 56: 1106-7 Je 3 '15 Photostat and its use. L. D. Burlingame. il Mach 21:951-4 Ag '15

Phototelegraphy

Electric transmission of pictures; abstract. J. Blondin. diag Elec W 65:479 F 20 '15 Electrolytic luminosity for phototelegraphic receiver. L. H. Walter. diag Elec W 66:139 JI 17 '15

Ji 17 '15
Facsimile telegraphy and phototelegraphy. Sci
Am 112:571+ Je 5 '15
Photographing speech; some recent investigations by Dr. Marage. J. Boyer, il Sci Am 112:
607-8 Je 19 '15
Fallanbetgraphia, appraytus, of Georges

Telephotographic apparatus of Georges Rig-noux. R. Arapu. diag Sci Am S 79:331 My 2

Sec also Telephotography

Phototherapy

hototherapy
Artificial light treatment of surgical tuberculosis, Sci Am S 80:175-6 S 11 '15
Uses of light in the treatment of disease.
E. C. Titus, Illum Eng Soc 10:135-42 no 2
'15; Same. Sci Am S 79:255 Ap 17 '15; Discussion, Illum Eng Soc 10:142-8 no 2 '15 Sec also Radiotherapy

Phrenology

Relation of phrenology to the study of character. Sci Am S 80:354-5 D 4 '15

Physical examinations

Chicago Elevated medical methods, H. E. Fisher. il Elec Ry J 45:1192-5 Je 26 '15 Efficient human machine. Sci Am 113:334 O 16

Examining the physique of Chicago Elevated employees. H. E. Fisher, il Elec Ry J 46: 216-19 Ag 7 '15 How to keep your men healthy. S. C. Coey. Iron Tr R 56:389-90 F 18 '15

Periodic physical examination of employes. E. L. Fisk. Am Ind 15:21-3 F; 22-3 Je '15

Personal biologic examinations, G: M. Gould. Sci Am S 79:146-7 Mr 6 '15

Physical control of employees. Eng & Min J 100:759 N 6 '15

Physical examinations of section foremen. W. E. Schott, Ry Age 57:1147 D 18 '14

Physician in industry; how the science of preventive medicine is minimizing accidents. S. M. McCurdy. Iron Age 95:401 F 18 '15; Same. Sci Am S 79:265 Ap 24 '15

Physical geography

See also Caves; Earth; Geology; Geysers

Physical laboratories

British national physical laboratory; abstract of annual report, electrical standards di-vision. Elec W 66:187-8 Jl 24 '15

British national physical laboratory; program of research work for 1915-16. Met & Chem Eng 13:870-1 N 15 '15

Physical laboratories—Continued

Metallurgical work at the National physical laboratory 1914-1915. Met & Chem Eng 13: 583-5 S 15 '15

National physical laboratory; abstract of annual report, Engineer 119:623-4 Je 25 '15

See also Electric laboratories

Physical measurements

Limits of experimental investigation. Sci Am S 80:83 Ag 7 '15 Measuring one twenty-millionth of an inch. E. Keil. il plan Sci Am 112:363-4 Ap 17 '15

nysics Advances in general physics. Sci Am S 80: 130 Ag 28 '15 Physics of the photographic process. C. E. K. Mees. diags J Fr Inst 179:141-60 F '15; Ab-stract. Met & Chem Eng 13:923 D 1 '15

stract. Met & Chem Eng 13;923 D I 'B. See also Air; Atoms: Capillarity: Chemistry, Physical; Compressibility: Dynamics: Evaporation; Fluids; Force and energy; Gases; Hydraulics; Light; Liquid air; Magnetism; Mechanics; Radiation; Radioactivity; Steam; Temperature, High; Thermodynamics; Thermometers; Units

Physiological apparatus Instrumental study of 112:630-1+ Je 26 '15 of the heart, il Sci Am

Physiological laboratories

Scientist and the athlete; the physiological laboratory of the French military school at Joinville, J. Boyer, il Sci Am S 79:292 My 8

Piano player records
Machine for making player-piano rolls at
home. il Sci Am 113;431 N 13 '15

Piano playing
Device for the simultaneous playing of violin
and piano. il Sci Am 113:471 N 27 '15

Picketing

Washington's new anti-picketing law. Iron Tr R 57:915 N 4 115

Pickling (metals)
Effects of pickling upon the corrosion of iron.
E. A. Richardson, Met & Chem Eng 12:759
D. [11] Same, Iron Age 95:621 Mr 18 [15]
Mesta pickling machines, il Metal Ind n s 13:
387 S [15]

Removing iron scale by pickling; theory vs. prartice. C. Hering. Met & Chem Eng 13: 785-6 N 1 '15

Picric acid

Explosion of picric acid. A. Cooper-Key. Engineer 119:155 F 12 '15
Synthetic phenol and picric acid. A. H. Ney.
Met & Chem Eng 13:686-90 O 1 '15; Same.
Sci Am S 80:346-7 N 27 '15

Pictures

See also Moving pictures

Piece work

reight car repairs under a piece work system, J. J. Tolin, Ry Age (Mech ed) 89:347-8 Jl '15

Master blacksmiths' convention; discussion of piece work. Ry Age (Mech ed) 89:473 S'15 Modern piece work system for a large plating department. C: H. Fleischer. Metal Ind n s 13:325-6 Ag'15

Modern plating practice: a piecework system as used by the National cash register company. W. Fraine. il Metal Ind n s 13:1-4 Ja

Piece rate system for wages in cotton mills. O. Elsas. Textile World 49:213-17 My '15 Piece work and bonus systems in the boiler shop. N. H. Ahsiuolh. Ry Age (Mech ed) 89:240-2 My '15

Piece work and its advantages. E. J. Thill. Ry Age (Mech ed) 89:122 Mr '15

Piece work for the paint shop. H. Heffelfinger. Ry Age (Mech ed) 89:526 O'15

Railway storekeepers' association: report. Ry Age 58:1043 My 21 '15 Special applications of the piece work system. H. F. Seward. J Account 20:122-8 Ag '15

Canadian Pacific terminal improvements at Vancouver, il plan Ry Age 58:614-16 Mr 19 '15

Connecticut shipping terminal at New London, W. E. Clarke, il diags Eng N 74:1028-32 N 25 '15

Covered slip and pier with gantry cranes for handling lumber, diags Eng N 74:494-5 S 9

Crib-and-concrete guide pier at the Black Rock ship lock, il diag Eng N 73:541-2 Mr 18 '15 Design features of the Commonwealth pier no.

Design features of the Commonwealth pier no. 1, East Boston, Mass. diags Eng & Contr 42:170-2 Ag 19 '14
Freight handling at Havana, Cuba. il Int Marine Eng 20:116-18 Mr '15
Life of port structures. P. P. Whitham. Eng N 74:829 O 28 '15
New deep water pier at Halifax, Nova Scotia. A. F. Dyer. il Concrete Cem 7:7-13 Jl '15; Same cond. Eng N 73:1204-10 Je 24 '15
New York's new piers. il diags Engineer 120: 193-5, 204 Ag 27 '15
Ninth street pier in Lake Erie at Cleveland, Ohio. il diags Eng N 74:258-60 Ag 5 '15
Notable step in the building of New York's great piers. R. G. Skerrett. il Sci Am 113: 160-1 Ag 21 '15
Paving for piers, warehouses and garages.

i60-1 Åg 21 '15
Paving for piers, warehouses and garages, plan Eng N 73:952-4 My 13 '15
Philadelphia's Southwark piers completed, il diags plans Eng Rec 72:478-80 O 16 '15
Progress on 46th street pier coffer-dam, 'New York city, il Eng N 73:908 My 6 '15
Shipping piers in Southwark district of Philadelphia, il diags plans Eng N 74:421-4 Ag 26

Suspended fenders a feature of new reinforcedconcrete piers at Sain Francisco, F. G. White, il diags Eng Rec 71:231-3 F 20 '15 Work to start in deep cofferdam for New Yorlpier, il Eng Rec 71:654-5 My 22 '15

See also Bulkheads: Wharves

Piers (bridges). See Bridges-Foundations and

Piers (foundations)
Large brick piers tested at laboratory o
Bureau of standards; abstracts. J. H. Griffith and J. G. Bragg. il Eng Rec 71:460-1 Aj
10 '15; Eng N 74:242-3 Ag 5 '15; Ind Eng 15

Piers, Municipal

Chicago municipal pier, il diags Eng N 74 193-7 Jl 29 '15
Longest municipal pier in United States i nearing completion at Chicago, il diags Eng Rec 71:778-80 Je 19 '15
Severe tests show Chicago municipal pier t be sound in construction, il Eng Rec 72:7 Jl 17 '15

Superstructure of Chicago municipal pier. Eng N 74:306-8 Ag 12 '15

1800 pies an hour: electrically operated ma chine. il Elec W 65:419 F 13 '15

Pig iron

Foundry iron prices Cincinnati and Chicage 1876 to 1914. Iron Age 95:13 Ja 7 '15

Low carbon pig iron for iron castings. Iro
Age 95:796-7 Ap 8 '15

Machines for breaking pig iron. il Iron Tr 1

56:1069 My 27 '15

Pig-iron production in 1914. Eng & Min 99:510 Mr 20 15

Production of pig iron in the United State in the first half of 1915. Iron Age 96:369 A 12 '15; Same. Iron Tr R 57:324 Ag 12 '15

Properties of southern foundry pig iron. J. W M'Queen. Iron Age 94:1294-5; Discussion L. R. Lemoine. 94:1295-6 D 3 '14 See also Cast iron

g iron mixer Modern foundry pig-iron mixer; operating an chemical results with blast-furnace an coke-oven gases; abstract. O. Simmersbacl Iron Age 96:812-13 O 7 '15

Piaments Artistic painting and the old masters. A Toch. il J Fr Inst 179:47-58 Ja '15 See also Dyes and dyeing; Paint

Pike's Peak
Build scenic highway up Pike's Peak. il Er
Rec 72:504-6 O 23 '15

Overhang piledriver, L. Goodday, diag Eng N 73:399 F 25 '15 Piledriver with traversing leads for driving trestle bents, il diags Eng N 73:28-9 Ja 7 '15 Priving a heavy 65-ft, piledriver, il Eng &

Raising a heavy 65-ft. piledriver. il Eng & Contr 44:347-8 N 3 '15 Trestle building hit easily moved pile driver. G: A. Eaton. il Eng Rec 71:501 Ap 17

Pile driving. See Piles and pile driving

Pile pulling
Pile pulling methods compared, il Eng Rec 71;
277 F 27 '15
Pulling falsework piles, il Eng N 73:553 Mr
18 '15

Pulling steel sheet piling with a steam ham-mer. W. F. Schaphorst. Eng & Contr 43: 217 Mr 10 '15 Pulling steel sheetpiles with an inverted steam hammer. il Eng N 73:218-19 F 4 '15

Pile testing

lie testing

Boston foundations. J. R. Worcester. Boston
Soc C E J 1:13-19 Ja '14; Discussion. 1:179248, 395-417 Ap, S '14

Data on test borings and test piles at site of
Field museum of natural history, Chicago. il
Eng & Contr 44:141-3 Ag 25 '15

Effect of steaming process of creosoting on
strength of Oregon fir piling; abstracts. H. B.
Macfarland, Eng Rec 70:487-8 O 31 '14; Eng
& Contr 42:481-3 N 18 '14; Summary. Eng N
72:863 O 29 '14

Jacking tests on piles. Eng N 74:559 S 16 '15

Loading test of lagged piles in soft silt. C. W.
Staniford. il Eng N 74:76-7 Jl 8 '15

Pile tests indicate type of substructure for
Technology buildings. C: T. Main. il Eng
Rec 72:235-8 Ag 21 '15

Results of experience with piles and pile
tests. J. W. Taussig. Eng N 72:1254-5 D 24
'14

Tests of piles in sand beach, Atlantic City,

ests of piles in sand beach, Atlantic City, N. J. F. W. Abbott, diag Eng N 74:28-30 Jl 1'15 Tests of

ests on treated and untreated Oregon fir piling. Ry Age 57:1156 D 18'14 Tests on

Piles and pile driving

iles and pile driving
Cement-coated piles repaired under water. Eng
Rec 72:674 N 27 '15
Data on test borings and test piles at site of
Field museum of natural history, Chicago. il
Eng & Contr 41:141-3 Ag 25 '15
Explosives loosen hard ground for driving concrete piles; abstracts. F. T. James. Eng N
74:558-9 S 16 '15; Eng Rec 72:240 Ag 21 '15;
Eng & Contr 44:332-3 O 27 '15
Foundation piles cut off above water line.
Eng N 74:158 Jl 22 '15
Machine for boring under-water holes in piles.
il Eng N 74:315 Ag 12 '15
New deep water pier at Halifax, Nova Scotia.
A. F. Dyer. il Concrete Cem 7:7-13 Jl '15;
Same cond. Eng N 73:1204-10 Je 24 '15
Piledriving destroys a tunnel by clay pressure.
il Eng N 74:404-5 Ag 26 '15
Pile-driving specifications. D: Gutman. Eng
Rec 71:784 Je 19 '15
Pile penetration with and without water jet.
F. Y. Parker. il Eng N 73:586-7 Mr 25 '15;
Abstract. Assn Eng Soc J 54:159-67 Ap '15
Piles driven under difficulties. il Eng Rec 71:

Piles driven under difficulties. il Eng Rec 71: 213 F 13 '15

Pressures on piles supporting masonry, R. I V. Marquardsen, diags W Soc E J 20:541-Je '15; Same, Eng & Contr 44:392-3 N :

Special outrigger for driving piles under trestles, il diags Eng N 72:1266 D 24 '14

Why not a rational specification for a wooden pile? E. P. Goodrich. Eng Rec 71:627-8 My 15'15; Same. Eng & Contr 43:456-7 My 19'15 See also Breakwaters: Concrete piling; Foundations; Pile drivers; Pile pulling; Pile testing

Piltdown man Mankind in the making. W. P. Pycraft. il Sci Am 112:100-1 Ja 30 '15

Commercial uses of longleaf pine, P. L. But-trick, il Am For 21:896-908 S '15

Forest service proposes grading rule for southern yellow pine. Eng Rec 72:55-6 Jl 10 '15 Growing pine at a profit. J. R. Simmons. il Am For 21:1043-6 N '15 Life history of shortleaf pine. W. R. Mattoon. diags 10 pls map U S Agric Bul 244:1-46 '15 Longleaf pine. il Am For 21:395-6 S '15 Longleaf pine distinguished visually from loblolly or shortleaf. A. Koehler. il Eng Rec 72: 319-20 S 11 '15 Norway pine in the lake states. T. S. Woolsey, jr. and H. H. Chapman. il map U S Agric Bul 139:1-42 '14 Seed production of western white pine. R. Zon. U S Agric Bul 210:1-15 '15 Specifications for yellow-pine bridge and trestle timbers. Ry Age 59:67-8 Jl 9 '15 Story of white pine. H. Maxwell. il Am For 21:34-46 Ja '15 Utilization and management of lodgepole pine

21:34-46 Ja 15 Utilization and management of lodgepole pine in the Rocky mountains. D. T. Mason, 7 pls map U S Agric Bul 234:1-54 '15 Waste pine wood utilization. J: E. Teeple. J Ind & Eng Chem 7:929-30 N '15

Pine oil

oils of the coniferae. IV—The leaf and twig oils of digger pine, lodgepole pine, and red fir. A. W. Schorger. J Ind & Eng Chem 7:24-A;15 6 Ja

Oleoresin of sand pine. A. W. Schorger. J Ind & Eng Chem 7:321-2 Ap 15

Pine-shoot moth

Pine-shoot moth, il Am For 21:637-40 My '15 Pineapples

Pineapple-canning industry of the world. J. A. Shriver, U S Bur For & Dom Com 91:1-43

Utilizing wastes in canning pineapples. Sci Am S 79:361 Je 5 '15

inions
Gears and pinions. R. H. Dalgleish, diags Elec
Ry J 45:942 My 15 '15
Home-made pinion puller. C. M. Feist, il Elec
Ry J 46:641 S 25 '15
Points on the installation and removal of
pinions. R. H. Parsons, diags Elec Ry J '45:
638-9, 674-5 Mr 27-Ap 3 '15
Removing pinions from motor axles. A. A.
Ross. Elec Ry J 45:80 Ap 24 '15
Test of power forcing press pinion. Mach 21:
770 My '15
Use of the gas flame in removing pinions.
R. H. Parsons. Elec Ry J 45:988 My 22 '15
inite

Pinite

Inosite and pinite and some of their deriva-tives. E: G. Griffin and J. M. Nelson. Am Chem Soc J 37:1552-71 Je '15

Pipe. See Pipes

Pipe brackets
Convenient form of wall bracket for pipes. il
Elec W 66:979 O 30 '15

Pipe cleaning

Machine for cleaning ascension pipes. diag Am Gas Light J 103:51 Jl 26 '15

See also Water pipes-Cleaning

Pipe covering
British method of coating steel pipes. W. Ingham. Eng & Contr 44:315 O 20 '15

Covering protects large penstocks from freezing; cement-mortar coating supported by special steel frame around pipe and reinforced with wire mesh, H. C. Huber, il diags Eng Rec 71:269 F 27 '15

Methods employed in field-coating two pipe lines—applying bitumastic enamel with spe-cial machines. Eng & Contr 44:311-12 O 20 '15

Protection of riveted steel pipe. L. Metcalf. Eng & Contr 42:598-9 D 30 '14

Tar paint proves better than lead paint on pipes. B. Dibble. Eng Rec 72:349-50 S 18 '15; Same. Eng N 74:973-4 N 18 '15; Same cond. Eng & Contr 44:181 S 8 '15

See also Steam pipe coverings

Pipe cutters Strickler ratchet pipe cutter. il Munic Eng 49: 156 O '15

Pipe elbows Circle to ellipse offset transition piece. diags Metal Work 84:616-17+ N 12 '15

Pipe elbows —Continued
Frictional losses in elbows and ducts. C: A.
Fuller, diags Metal Work 84:371-2 S 17 '15
Loss of pressure due to elbows in the transmission of air through pipes or ducts. F. L.
Busey. Am Soc Heat & V E 19:366-76 '13
Pattern for offset in ventilation pipe. Metal
Work 83:571-3+ Ap 16 '15
Patterns for compound curve elbow of copper. diags Metal Work 83:417-19 Mr 19 '15
Patterns for sheet metal transforming elbow, diags Metal Work 83:3578 Mr 5 '15
Simple chart for designing furnace elbows.
Metal Work 84:210-11 Ag 13 '15

Pipe fitting

See also Gas fitting; Pipe joints; Plumbing; Steam pipes

Pipe fittings

Developing patterns for water pipe lateral. Developing patterns for water pipe lateral. diags Metal Work 84:492-3 O 15 '15 Pattern for angular boot of varying section. diags Metal Work 84:456-7 O 8 '15

Sec also Furnaces, Hot air-Pipes and fittings

Pipe flanges

Institution of mechanical engineers discusses

Institution of mechanical engineers discusses strength of pipe flanges, Engineer 119:102, 104 Ja 29 '15' 1915 U. S. standard schedule of flanged fittings and flanges. Eng & Min J 99:1121 Je 26 '15; Same. Power 41:782 Je 8 '15 Progress of standard flange schedule. Heat & Ven 12:44-6 Ag '15 Standardisation of pipe flanges and flanged fittings, J: Dewrance, diags Engineer 119: 124-5 Ja 29 '15; Abstract. Am Soc M E J 37: 189-90 Mr '15

Pipe hangers

Various types of pipe hangers. H. L. Alt. diags Dom Eng 73:66-8, 100-2 O 16-23 '15

Pipe joints

Acetylene welding of gas pipe, G: H. Manlove, il Iron Tr R 55:272-3 F 4 15; Abstract, Ind Eng 15:57-8 F '15

Autogenous pipe welding, il Iron Age 95:296-7

Ball joint for blow-pipe connection. diags Metal Work 83:294-5 F 19 '15 Cast iron submarine aqueduct, il diags Engi-neer 120:176-8, 180 Ag 20 '15 Caulking lead joints with compressed air at Waltham, Mass. Eng & Contr 42:290-1 S 23

Cement instead of lead for pipe joints. Eng N

How to make good joints in cast iron water mains with leadite. W. C. Hawley. Eng & Contr 44:200-2 S 15 '15; Same cond. (Experiences in calking joints of water mains) Eng Rec 72:326 S 11 '15

Joint details in high-head pipe lines—data on pipe lines throughout the world. L. C. Froh-rieb. il Eng & Contr 44:77-8 Jl 28 '15

Joints for wrought-iron and steel pipe. R. S. Lord. diags Eng N 74:1035-7 N 25 '15

Lead wool as jointing material; abstract. C. E. Reinicker. il Am Gas Light J 102:242-6 Ap 19 '15; Abstract (Methods and cost of pneumatic calking of lead wool joints) Eng & Contr 43:520-2 Je 9 '15

Leadite joints for water pipes; abstracts. H. A. Symonds; W. C. Hawley. Munic J 39:443 S

Leakage from lead joints: costracts. A. H. Smith. Munic J 39:470-1 S 23 '15; Eng & Contr 44:313-14 O 20 '15

Making a Van Stone joint under difficulties. il Power 42:300-1 Ag 31 '15

Mortar joint laid with canvas band in wet trench. D. H. Fleming, diags Eng Rec 72:240 Ag 21 '15

Narrows flexible joint submarine siphon. J: P. Hogan. il diags plans Eng Rec 70:656-9 D 19

Hogan. It diags plans Eng Rec 70:555-9 D 19
'14
Oxyacetylene welding in pipe work. W. L.
Roueche. Il Power 41:508-11 Je 15 '15
Pipe couplings. R. S. Lord. diags Eng Soc W
Pa 31:417-37 Je '15; Excerpt. Iron Age 95:
1352 Je 17 '15; Discussion. Eng Soc W Pa
31:438-58 Je '15
Pipe joint fails by pulling out at elbow. il Eng
Rec 72:390 S 25 '15
Pipe joint for very high pressure. diags Am
Gas Light J 103:333 N 22 '15
Pipe welding at Panama Pacific exposition.
il Metal Work 84:237-8 Ag 20 '15
Plant and methods employed in laying the
flexible-jointed Narrows syphon of the
Catskill aqueduct. S. W. Symons. il Eng &
Contr 43:218-19 Mr 10 '15
Pressent practice of gas distribution by British
undertakings. W. Hole. il Am Gas Light J
103:307-9 N 15 '15
Pressed steel uito of new design. il Iron Age

Pressed steel union of new design, il Iron Age 95:1296 Je 10 '15
Repairing leaks in flexible jointed water main in 40 ft. of water, Galveston harbor, Texas. N. T. Blockburn, diags Eng & Contr 42:163-4 Ag 12 '11 Ross expansion joint. diag Power 41:375 Mr 16

Thermit welding. W. R. Hulbert. Am Gas Inst Pro 9:pt 2, 1182-4 '14 Use of riveted or screw jointed pipe for sub-merged lines. C. Herschel. Eng & Contr 44: 409-10 N 24 '15

409-10 N 24 '15
Water main under New York harbor from Brooklyn to Staten Island. J. F. Springer. il diag Munic Eng 49:92-5 S '15
Welding of high pressure mains. J. D. Shattuck. il diags Am Gas Inst Pro 9:pt 2, 945-1011 '14; Same abr. Am Gas Light J 102:54-5, 58-60, 66-9 Ja 25-F 1 '15; Discussion. Am Gas Inst Pro 9:pt 2, 1011-52 '14
Welding water and gas mains. il Sci Am 112: 272+ Mr 20 '15
Wiping a lead-covered cable. H. E. Weightman. il Elec R & W Elec'n 66:901-2 My 15 '15 ine laying

man. il Elec R & W Elec'n 66:901-2 My 15'15

Pipe laying
Barge with skidway lays 300-ft. line of 12-in.
pipe in five hours. A. G. Elliot. il Eng Rec
72:611 N 13'15
Cast iron submarine aqueduct. il diags Engineer 120:176-8, 180 Ag 20'15
Conditions encountered and methods employed
in laying water pipes in the congested
streets of New York city. M. Blatt. Eng &
Contr 44:246-7 S 29'15
Connecting cast-iron pipe sections under
water. il Eng N 74:896 N 4'15
Field and office methods in connection with
the laying and repair of large water mains
at San Diego, Calift. W. W. Albin. Eng &
Contr 43:26-7 Ja 13'15
Flexible bronze tubing of the Partridge Island
pipe line. il diag Eng N 73:1167-8 Je 17'15;
Same cond. Am Gas Light J 103:42 Jl 19'15
48-inch cast iron force main for Atlantic City,
New Jersey. L Van Gilder. il Am Water
Works Assn J 1:704-8 D '14; Same. Eng &
Contr 43:77 Ja 27'15
Installation and maintenance of services. R. B.

Contr 43:77 Ja 27 '15
Installation and maintenance of services. R. B. Duncan. il diags Am Gas Inst Pro 9:pt 2, 1052-1161; Discussion. 9:pt 2, 1161-82 '14
Laying a 6-ft, pipe tunnel across the Milwaukee river. il diags Eng N 73:522-4 Mr 18 '15
Laying a submerged sewer outlet at San
Francisco. A. J. Cleary. il Eng N 73:325 F
18 '15

Laying and repairing water mains. W. W. Albin. Metal Work 84:102 Jl 23 '15
Laying submerged outfall sewer in surf. A. J. Cleary. il Eng N 74:413-14 Ag 26 '15
Laying water main in tunnel to avoid frozen ground. A. Cohn. Eng N 73:891-2 My 6 '15
Limits of precision in laying submerged water mains. D. D. Clarke. Eng & Contr 44:76 Jl 28 '15

28 '15 Lowering a submarine pipe by piledrivers, il diag Eng N 72:1264 D 24 '14 Lowering mains under pressure and cost of laying water mains at San Diego, il Eng & Contr 42:419-20 O 28 '14

Pipe laying —Continued

Manufacturing and laying reinforced concrete sewer pipe at Philadelphia. il Eng & Contr 43:245-7 Mr 17 '15

Method and cost of constructing a 6-mile water main, of 3-in, screwed pipe, for New Orleans Lake Shore land co. A. M. Shaw. Eng & Contr 43:222 Mr 10 '15

Method employed in lowering water intake pipe through ice at Gilbert, Minn. A. Cohn. diags Eng & Contr 44:81 Ag 4 '15

Moving a 30-in, gas main. R. J. Van Wagner. il Eng N. 74:1082 D 2 '15

Narrows flexible joint submarine siphon. J: P. Hogan. il diags plans Eng Rec 70:656-9 D 19 '14

19 14
Oneida street crossing under Milwaukee river.
Il plan Eng Rec 70:616-17 D 5 '14
Placing a jointed concrete pressure pipe inside a brick tunnel for water-supply, Baltimore. il diags Eng N 73:600-2 Mr 25 '15
Protection of pipes when buried under the floor, diag Elec W 66:592 S 11 '15
Pushing service pipes under pavements. F. C. Amsbary. Am Water Works Assn J 1:719 D '14
Piyer crossings on the Nepaus pipe line. E. C.

114
River crossings on the Nepaug pipe line. E. C.
Miles. il Munic J 38:249-51 F 25 '15
Rush work after storm restores Galveston's
water supply and rail connections. E. B.
Van De Greyn, il Eng Rec 72:500-1 O 23 '15
7000-foot pipe line floated to place in Lake
Ontario in long sections. N. A. Brown. il
diags Eng Rec 72:20-1 Jl 3 '15
Subaqueous pipe taken up and replaced 3
feet lower. E. M. Blake. Eng Rec 72:69-70
Jl 17 '15
Three types of bridge for carrying gas mains

Three types of bridge for carrying gas mains across subway cuts. il Eng Rec 72:207 Ag

14 '15
Use of riveted or screw jointed pipe for submerged lines, C. Herschel, Eng & Contr 44: 409-10 N 24 '15
Water main under New York harbor from Brooklyn to Staten Island, J. F. Springer, il diag Munic Eng 49:92-5 S '15
Welding of high pressure mains, J. D. Shattuck, Am Gas Inst Pro 9:pt 2, 994-1006 '14; Same cond, Am Gas Light J 102:67-8 F 1 '15 See also Pipe lines; Street openings

#### Cost

Comparative costs of laying 16- and 12-ft. pipe. Eng N 74:318 Ag 12 '15 Comparison of actual cost of laying 6-in. cast iron water pipe in 12 and 16 ft. lengths at Council Bluffs, lowa. Eng & Contr 44:161

Cost of laying cast iron water pipe for railway service. C. R. Knowles. Eng & Contr 42:383 O 21 '14

Costs of 12- and 16-ft. lengths of cast-iron pipe laid. F. C. Roberts. Eng N 74:641 S 30 '15

Ten and three-quarters miles of 36-inch riveted-steel pressure line built on Sooke work. B. Ehle. il plan Eng Rec 72:564-5 N 6 '15

Pipe lines

Color scheme for identifying pipe lines. Elec W 65:936-7 Ap 10 '15

Comparative merits of four types of location of underground utility lines. L: A. Dumond. Eng & Contr 44:357-9 N 3 '15

Crossing water pipes over trolley wires. G. H. McKelway. il Elec Ry J 46:770-1 O 9 '15

Data on the life of wooden pipe pertaining to 79 pipe lines. D. C. Henny, tables Eng & Contr 44:127-30 Ag 18 '15; Same. Eng N 74: 400-3 Ag 26 '15

Design and construction features of Chicago's first utilities gallery, il diags Eng & Contr 44:376-7 N 10 '15

Hauling heavy water pipes, E. C. Miles, il Munic J 38:97-9 Ja 28 '15

Insulation of underground piping. Elec R & W Elec'n 67:194 Jl 31 '15

Joint details in high-head pipe lines—data on pipe lines throughout the world. L. C. Froh-rieb. il Eng & Contr 44:77-8 Jl 28 '15

Lightning attraction for water and gas pipes. H. W. Spang. Eng & Contr 44:340 O 27 '15

Method and cost of making a relocation survey of underground pipe lines. O. E. Carr, plans Eng & Contr 42:153-5 Ag 12 '14; Same cond. (Underground survey of Cincinnati). Eng Rec 71:38-40 Ja 9 '15

Eng Rec 71:38-40 Ja 9 '15 Method of protecting water lines from freezing, diags Elec W 66:320 O 23 '15 Methods employed in field-coating two pipe lines—applying bitumastic enamel with special machines. Eng & Contr 44:311-12 O 20

Pipe pontoon used for reclaiming pipe line in bed of Ottawa river. Eng Rec 71:755-6 Je 12 '15

Pipe subways for the public utilities of Chicago. L: A. Dumond. Eng Rec 70:705-6 D 26

Practical procedure in designing steel pen-stocks. V. P. Marran, il diags Eng Rec 71: 355-6 Mr 20 '15

355-6 Mr 20 '15
Progress map records accurately water-main construction. Eng Rec 71:566 My 1 '15
Protection of pipe lines against alkali. C. P. Bowie. Eng & Min J 99:367 F 20 '15
7000-foot pipe line floated to place in Lake Ontario in long sections. N. A. Brown. il diags Eng Rec 72:20-1 Jl 3 '15
Steam-pipe installation; two old boiler plants piped to give a common steam supply. H. E. Collins. il diags Power 41:288-91 Mr 2 '15

Subways for public-utility pipes and wires in Chicago streets. Eng N 73:60-1 Ja 14 '15; Same. Am Gas Light J 102:76 F 1 '15 Underground pipes in New York city streets. Eng N 74:280-1 Ag 5 '15

See also Electrolytic corrosion; Gas distribution; Gas pipe lines; Petroleum pipe lines; Pipe laying; Pipes, Steel; Steam pipes; Street openings; Water pipes; Water supply engi-

## Law

United States mining statutes annotated. J. W. Thomson, U S Bur Mines Bul 94:pt 2, 1068-73 '15

Pipe lining

ethod of lining wrought, steel and cast iron pipe with cement, diag Eng & Contr 42:547-8 D 9 '14 Method

Pipe thawing. See Thawing

Pipe threading machines

pe threading machines Convenient control for Crane company pipe machine. il Iron Tr R 57:691 O 7 '15 Landis pipe threader and cutter. il Iron Tr R 57:266 Ag 5 '15; Iron Age 96:291 Ag 5 '15; Mach 21:1020-1 Ag '15 Ratchet stock of novel design. il Iron Tr R 57: 691 O 7 '15

Pipe threads

Pipe threads Pipe threading die for screw machines. il Iron Age 95:183 Ja 21 '15 Protector for threaded ends of pipe. il Iron Age 96:137 Jl 15 '15; Iron Tr R 57:138 Jl 15 '15

Piperonal

Condensation of vanillin and piperonal with certain aromatic amines. A. S. Wheeler. Am Chem Soc J 37:1362-4 My '15

Pines

American pipe and fittings in South Africa. Iron Age 96:1230-1 N 25 '15 Apparatus for making accelerated comparative durability tests of small pipe. il Eng & Contr 43:582 Je 30 '15; Eng N 74:25 Jl 1

Electrolytic corrosion in pipes. Metal Work 84:302 S 3 '15

External corrosion of cast iron pipe; abstracts.
M. R. Pugh. Munic J 37:424-5 8 24 '14; Am
Soc M E J 36:0199 O '14; Eng & Contr 42:37781 O 21 '14; Am Gas Light J 103:65-70 Ag 2

Patterns for offset Y from circular pipe. diags Metal Work 84:67-9 Jl 16 '15 Proportioning pipes. T: Tait. Dom Eng 72:198

Ag 14 '15

Aules for thickness of cast-iron pipes. Power 42:115 Jl 27 '15 Rules for thickness of wrought-iron and steel pipes. P. R. Björling. Power 42:142 Ag 3 '15 Rules for weight of cast-iron pipes. Power 41:

Pipes Continued

ipes Continued
Simple test for ascertaining whether pipe is of wrought iron or steel. D. R. Gwinn. Eng & Contr 44:411 N 24 '15
Simple tests for identifying steel and wrought iron pipe. Eng & Contr 44:295 O 13 '15
Simplified graphical or analytical process for the determination of dimensions of pipes in ventilating and heating installations; abstract. Brabbée and Bradtke. Am Soc M E J 37:552-3 S '15
Standard graphit pipe bonds diags Power 42:

Standard wrought pipe bends. diags Power 42:

546 O 19 '15

Wrought-iron Vrought-iron or steel pipes? L. C. Wilson. Eng M 50:247-54 N '15

See also Air pipes; Gas pipes; Heating pipes; Hot water heating; Oil piping; Pipe laying; Pipe lines, and other headings beginning Pipe; Piping (power plants); Plumbing; Sewer pipes; Siphons; Steam pipes; Tubes; Water pipes

#### Exhibitions

Panama-Pacific exposition. il Power 42:586-8 O 26 '15

#### Repair

Repairing leaks and breaks, J. E. Noble, diags Power 40:818 D 8 '14; Same, Eng & Min J 98:1099 D 19 '14

# Specifications

Proper specifications for and inspection of interior gas piping. A. E. Turner. Am Gas Inst Pro 9:pt 2, 1311-26 '14; Same (Standardizing gas piping specifications) Metal Work 82: 764-7 D 11 '14; Discussion. Am Gas Inst Pro 9:pt 2, 1327-37 '14

iron pipe specifications. Iron Tr R and

57:44-5 Jl 1

Pipes, Concrete
Casting concrete pipe out of doors in winter at Hamilton, Ontario, A. F. Macallum. il Concrete Cem 7:174 N '15
Collapsible core for reinforced concrete pipe construction. diag Concrete Cem 5:238 D '14
Concrete culvert pipe and concrete piles. Ry Age 59:762-3 O 22 '15
Construction of the Sooke gravity flow line at Victoria, B. C. il Concrete Cem 6:299-300 Je '15

'15
Holds pipe reinforcement while wiring is being done. il Eng Rec 71:785 Je 19 '15
Load tests of concrete pipe, E. R. Conant. il
Eng N 74:556-7 S 16 '15
Manufacture of concrete sewer pipe. il Metal
Work 82:833-4 D 25 '14
Manufacturing and laying reinforced concrete
sewer pipe at Philadelphia, il Eng & Contr
43:245-7 Mr 17 '15
Parmley system of reinforced concrete arch
construction. il diags Munic J 38:710 My 20
'15

lacing a jointed concrete pressure pipe inside a brick tunnel for water-supply, Baltimore, il olags Eng N 73:600-2 Mr 25 '15 Placing a

more. If older Eng. N. 131000-2 MF 25 15
Popularity of concrete pipe is increasing. C: E. Sims. Concrete Cem 7:36 JJ '15
Pressure test shows little leakage from huge molded concrete pipe. Il Eng Rec 72:537-8 O

Reinforced-concrete einforced-concrete pipes replace girder bridge, il diag Eng Rec 71:688 My 29 '15

Severe test of concrete pipe joint, il Concrete Cem 7:191 N '15

Tests of circular and egg-shaped reinforced concrete sewer pipe. A. T. Goldbeck. il diags Eng & Contr 43:307-9 Ap 7 '15; Same, with table. Concrete Cem 6:232-5 My '15; Same (Reinforced-concrete sewer pipe tested for stiffness and impermeability)
711-12 Je 5 '15 Eng Rec 71:

Tests of some large reinforced concrete culvert pipe. W. J. Schlick. il diag Concrete Cem 6: 78-80 F '15

Virgin country renders concrete pipe line con-struction difficult. B. Ehle. il diags plan Eng Rec 72:507-10 O 23 '15

Pipes, Furnace. See Furnaces, Hot air-Pipes and fittings

Pipes, Gas. See Gas pipes Pipes, Sewer. See Sewer pipes Pipes, Steel

Corrugated shell for pressure pipe. W: A. Dunk-ley; J. E. Noble. Power 41:584-5 Ap 27 '15 Corrugated shell for pressure pipe. il Iron Age 96:15 Jl 1 '15 Making pipes in India. Metal Work 82:767-8 D

11

Manufacture of steel pipe, il Colliery 35:333-4

Ja '15
Movable bulkhead for testing steel pipe line in sections after erection. diags Eng & Contr 44:317 O 20 '15
Practical procedure in designing steel penstocks. V. P. Marran. il diags Eng Rec 71: 355-6 Mr 20 '15
Protection of riveted steel pipe. L. Metcalf. Eng & Contr 42:598-9 D 30 '14
Rapid rise of steel pipe. Eng M 48:sup1-2 Ja '15
Rise of steel pipe. Ry R 56:68 Ja 9 '15
Ten and three-quarters miles of 36-inch riveted-steel pressure line built on Sooke work. B. Ehle, il plan Eng Rec 72:564-5 N 6 work. B. Ehle. il plan Eng Rec 72:564-5 N

Pipes, Water. See Water pipes

Pipes, Wood

Constructing logarithmic charts for hydraulic formulas. L. G. Hall. Eng & Contr 44:31-2 Jl 14 15

Jl 14 '15
Costs of continuous wood stave pipe lines. S. O. Jayne. Eng & Contr 44:56-7 Jl 21 '15
Data on the life of wooden pipe pertaining to 79 pipe lines. D. C. Henny. tables Eng & Contr 44:127-30 Ag 18 '15; Same. Eng N 74: 400-3 Ag 26 '15; Excerpt. Eng Rec 72:162 Ag 7 '15; Excerpt. Eng & Min J 100:476 S 18

Decay of wood pipes. Eng Rec 71:110 Ja 23 '15 Decay of wood pipes. Eng Rec (1.11) 3a 25 19 Durability of wood pipe and factors affecting it. S. O. Jayne. Eng & Contr 44:19-21 Jl 7'15 Economic considerations justify wood-stave pipe for water-power penstocks; comparison with steel. R. E. Horton. Eng Rec 71:356-8 Mr 20'15

Mr 20 '15
Experiences with machine banded wooden
water pipe in New Hampshire; abstracts.
A. W. Dudley. il Eng & Contr 44:223-4 S 22
'15; Munic J 39:471-2 S 23 '15
Laying wood-stave pipe to replace steel pipe.
il Eng N 74:1085 D 2 '15
New Chittenden, Vt., plant of the Pittsford
power co. T: Fraher. il Eng N 74:14, 16 J1

1 '15
Use, design, construction, cost and durability of wooden stave pipe. A. Swickard. il diags Eng & Contr 42:422-4, 516-19; 43:10-14, 146-8, 483-6 N 4, D 2 '14, Ja 6, F 17, Je 2 '15
Values of n for wood stave pipe. S. O. Jayne. Eng & Contr 44:60 Jl 21 '15
Wood pipes in New Hampshire. A. W. Dudley. il Munic J 39:471-2 S 23 '15

Convenient weighing pipet. F. Hall. diag Am Chem Soc J 37:2062-3 S '15 Modified burette calibrating pipette and cer-tain points in the use of such instruments. C. W. Foulk. diag J Ind & Eng Chem 7:689-93 Ag '15

**Pipettometers** 

Description of a pipettometer, W. D. Frost. diag Am Chem Soc J 36:1785-7 Ag '14

Piping (power plants)
Cumberland Edison power plant. W. O. Rogers. il plans Power 42:707 N 23 '15
New Morrison hotel plant, Chicago, T: Wilson, plan Power 42:71-3 Jl 20 '15
New Penn Central power co.'s Williamsburg plant. W. O. Rogers. il plans map Power 42:570-8 O 26 '15
Pipes for steam engines. F: W. Calmar No. 14

Parts. W. G. Rogers. It plans map Power 42:570-8 O 26 '15

Pipes for steam engines. F: W. Salmon. Power 41:88 Ja 19 '15

Piping and supports in municipal plant. A. D. Williams. il diags Power 41:463-5 Ap 6 '15

Power piping society has produced a standard power plant piping specification. Iron Age 96:388 Ag 12 '15

Savage manufacturing co.'s power plant, Savage, Md. W. O. Rogers. il plans Power 42:38-43 Jl 13 '15

Steam-pipe installation; two old boiler plants piped to give a common steam supply. H. E. Collins. il diags Power 41:288-91 Mr 2 '15

Steam piping. Power 41:443-4 Mr 30 '15

See also Steam pipes

See also Steam pipes

#### Piqua, Ohio

#### Railroads

Pennsylvania improvements through Piqua; new station and second track on revised grade, eliminating eight street grade cross-ings. il plans Ry Age 58:1003-6 My 14 '15

Pistols

Development of the army pistol. E; C. Crossman, il Sci Am 113:288 O 2 '15 Sweep-milling and shaving operations on pistol frames, il diag Mach 21:686-7 Ap '15

Piston rings

A. C. A. makes two certified tests. Horseless Age 35:122 Ja 20 '15
A. C. A. tests tireseal and multiple rings. Automobile 32:110+ Ja 21 '15
Burd high-compression rings. il Power 42:652
N 9 '15

Facing piston rings. A. F. Mansberger, diags Mach 22:60 S '15

Mach 22:60 S '15
Ford methods and the Ford shops. H. L. Arnold. ii Eng M 48:715-21 F '15
Machining a piston ring. G. Strom. diags
Power 41:353-4; 42:203 Mr 9, Ag 10 '15
Machining a piston ring. H. R. Low. Power
42:312-13 Ag 31 '15
Machining a piston ring. S: L. Robinson, il
Power 42:24-5 J1 6 '15
Mixture for piston rings. W. J. Keep. Foundry
43:240 Je '15
Piston ring problems. A. J. Mummert. Auto-

43:240 Je '15
Piston ring problems. A. J. Mummert. Automobile 32:624-5 Ap 8 '15
Piston ring problems—faults and advantages of various sorts of ring. C. H. Endebrock. Automobile 32:364-5 F 25 '15
Steel piston rings. Mach 21:827 Je '15

-Pistons

Advantages of sand-cast pistons. W. M. Levett. Automobile 33:878-9 N 11 '15
Allowances for gas engine piston fits: abstracts. E. W. Weaver. Mach 21:491 F '15; Horseless Age 35:110-11 Ja 20 '15; Power 41:245 F 16 '15
Aluminum alloy piston. J. E. Diamond. il diag Automobile 33:551-2 S 23 '15
Aluminum alloy pistons. E. Gruenwald. Horseless Age 35:806+ Je 16 '15
Aluminum piston critics answered. J. Leopold and J. E. Diamond. Automobile 33:744-5 O 21 '15

Aluminum piston critics answered. J. Leopold and J. E. Diamond. Automobile 33:744-5 O 21 '15
Aluminum piston will never prove success in truly high-duty motor, F. R. Porter. Automobile 33:420-1 S 2 '15
Aluminum pistons. Horseless Age 36:326 O 1 '15
Aluminum pistons pass unchallenged. Automobile 32:1116-17 Je 24 '15
American alloys best. J. Leopold. Automobile 32:31969 N 25 '15
Analyzing heat flow; use of aluminum for automobile motor construction. E. H. Sherbondy. Automobile 33:834-5 N 4 '15
Chucking ring and jaw extension for turning pistons. H: Doren. diag Mach 21:1010 Ag '15
Cracked and seized pistons on Diesel engines. G: E. Windeler. diags Power 42:210-11 Ag 10 '15: Abstract. Int Marine Eng 20:416 S '15
Early days of aluminum pistons. J. Leopold. Automobile 33:650-1 O 7 '15
Ford methods and the Ford shops. H. L. Arnold. il Eng M 48:711-15 F '15
Light pistons make smooth motor. E. W. Walford. diags Automobile 32:362-3 F 25 '15
Making aero motor pistons: tool equipment used on Cleveland automatics. D. T. Hamilton. il diags Mach 21:300-2 D '14
Old piston used for a core box. A. F. Albert. diags Mach 21:748 My '15
Overcoming the slap of aluminum pistons. P. M. Heldt. Horseless Age 36:227-8 S 1 '15
Piston practice; present day design with special reference to aluminum alloy. J. E. Diamond. il diags Automobile 33:871-7 N 11 '15; Discussion. 33:921-4 N 18 '15
Predicts: adoption of aluminum pistons as standard by majority of cars. W. M. Levett. Automobile 33:421+ S 2 '15
Prefers iron or steel to aluminum. E. H. Sherbondy. Automobile 33:651-2 O 7 '15
Rolled and forged steel pistons. W. W. Scott, jr. il diags Ry R 56:48-52 Ja 9 '15; Same cond. Ry Age (Mech ed) 89:343-5 J1 '15; Abstract. Am Soc M E J 37:191-2 Mr '15
Watch your pistons! Old Scotch. Int Marine Eng 20:407 S '15

Pitch filler. See Pavements-Fillers

Pitchblende

Pitchblende of Cornwall, England, R. A. F. Penrose, jr. Econ Geol 10:161-71 F '15

Pitchometer

Pitchometer and its use, N. I. Mosher, diag Mach 21:923 Jl '15

Pitometer

itometer
Graphic recorder for the Cole pitometer. il
diags Eng N 73:875 My 6 '15
Increasing precision in pitometer survey work
at Washington, D. C.—meter reading. Eng
& Contr 43:26 Ja 13 '15
Rerating a pitometer. C. G. Gillespie, il Eng
Rec 72:144 Jl 31 '15
Water waste surveys in the District of Columbia P. Lanham. il Eng & Contr 43:275-6 Mr
24 '15

bia P 24 '15

Pitot tube

Gas volume and dust concentration determination in connection with the Cottrell process. W: N. Drew. diags Am Soc M E J 37: 676-8 D '15

Standardization of the use of the Pitot tube: report of committee, diags Am Soc Heat & V E 20:210-15 '14

Sce also Pitometer

# Pittsburgh, Pennsylvania

## Architecture

Masonic temple, Pittsburgh, il Arch & Bldg 47:289-94 Ag '15

## Bridges

Construction features of the Bloomfield bridge. A. E. Sortore. il Eng & Contr 43:6-8 Ja 6

Design features of the cantilever, simple-truss

Design features of the cantilever, simple-truss and girder spans of the Bloomfield bridge, diags Eng & Contr 42:240-3 S 9 '14
Design features of the substructure and approaches of the Bloomfield bridge, diags Eng & Contr 42:295-7 S 23 '14
Design of the 531-ft, truss spans of the North side Point bridge, diags Eng & Contr 41: 358-61, 684-5; 42:196-8 Mr 25, Je 17, Ag 26 '14

## Parks

Schenley park approach competition. C. F. Pilat. il plan Arch Rec 38:595-9 N '15

## Railroads

New freight and transfer station by Pennsylvania R. R. il Ry R 56:278-80 F 27 '15

# Rapid transit

Pittsburgh railways claim department. Elec Ry J 46:139-45, 436-41 Jl 24, S 11 '15

## Water supply

Construction features of the North side reservoir. E. E. Lanpher and J. S. Cole, il Eng Soc W Pa 30:669-86 O '14; Same Eng & Contr 42:577-9 D 23 '14; Same cond. Munic J 38:558-62 Ap 22 '15; Discussion, Eng Soc W Pa 30:686-92 O '14

Design and construction of the North side reservoir, il diags plan Concrete Cem 6:227-31 My '15

Interesting chart of Pittsburgh water system, showing its recent transformation. diag Eng N 73:250-1 F 11 '15

Pittsburgh university. Mellon institute
Dedication of the new building of the Mellon
institute, W. A. Hamor, il J Ind & Eng
Chem 7:326-8 Ap '15; Same cond. Met &
Chem Eng 13:266-7 Ap '15

Description of the new building of the Mellon institute. W. A. Hamor, il plans J Ind & Eng Chem 7:333-43 Ap '15

Object and work of the Mellon institute. R. F. Bacon. J Ind & Eng Chem 7:343-7 Ap '15
Research institute; Mellon laboratories are fully equipped for solving manufacturing problems. C. F. Williams. il Iron Tr R 56:768-9 Ap 15 '15

Research work at the University of Pitts-burgh. S: R. Scholes. Foundry 43:237 Je '15

Unique system of service to industry. J: J. O'Connor. il Am Ind 16:27-8 O '15

Pituitary gland

On the presence of histidine-like substances in the pituitary gland (posterior lobe). T. B. Aldrich. Am Chem Soc J 37:203-8 Ja '15 Therapeutic uses of preparations of the ductless glands. R. G. Torrey. Sci Am S 80:134 Ag 28 '15

Placer mining. See Hydraulic mining

See also Rat proofing

Plainfield, New Jersey

Sewerage

Operation of the Plainfield sewage-works. J. R. Downes, Eng N 73:234-5 F 1 15

Plancton. See Plankton

Plane table. See Topographical drawing

Planimeters

Improved rolling hatchet planimeter, F: W. Salmon, diags Power 42:122 Jl 27 '15
Polar planimeter, S. B. Redfield, Power 42: 619-20 N 2 '15
Recording power plant operations, J. C. Smallwood, il Eng M 50:386-9 D '15

Planing

Planing a block square. H. Murphy. diags
Mach 21:495 F '15

Planing machines

Building machines
Building rotary planing machines. il Iron Age
94:1440-2 D 24 '14
Gleason 30-foot herringbone and spur gear
planer. il diags Mach 21:503-5 F '15
Handling large work on a small planer. J:
Leafstrom. diag Mach 22:60 S '15
Home-made planer used to size large timbers
on the job. R. W. Cady. il Eng Rec 72:396
S 25 '15
Motor driver slide plate planer, il Jean Tr. D.

Motor driven slide plate planer, il Iron Tr R 56:269-70 F 4 '15; Ry Age (Mech ed) 89:95 F '15

F '15 Scientific American and the planing mill mo-nopoly. Sci Am 112:546 Je 5 '15 16-ft. four-head planing machine. il Iron Age 96:131-2 Jl 15 '15 Turret head for planing guides, shoes and wedges. B. O. Yearwood. il Ry Age (Mech ed) 89:187 Ap '15

Plankton

the ultimate food. Sci Am S 79:66 Plancton, t Ja 30 '15

Plans (architecture). See Architectural draw-ing: Architecture—Designs and plans; Archi-tecture, Domestic—Designs and plans

Plant breeding

Artificial production of vigorous trees. Sci Am S 79:150 Mr 6 '15 Experiments in hybridizing Japanese flowers. W. P. Jenny. Sci Am S 79:18-19 Ja 9 '15

Plantations, Railroad. See Railroads-Plantations

Promoting the growth of vegetation on the slopes, W. F. Rench, Ry Age 58:471-2 Mr slopes.

See also Insectivorous plants

Movements

See Heliotropism

Temperature

Temperature in plants, S. L. Bastin, il Sci Am 112:54 Ja 9 '15

Plants, Chemical analysis of Modified method for determining carbon-free ash in plant substances. G: E. Boltz. J Ind & Eng Chem 7:859-69 0 '15

Total amino nitrogen in the seedlings of the Alaska pea. T: G. Thompson. Am Chem Soc J 37:230-5 Ja '15

Plants, Effect of narcotics on

How narcotics affect plants. Sci Am S 79:267 Ap 24 '15

Plants, Effect of radioactive substances on Influence of radio-active earth on plant growth, H. H. Rusby, il Sci Am S 79:216-18, 228-30 Ap 3-10 '15 Radio-active ores and plant life. H. Bastin. il Sci Am 112:335 Ap 10 '15

Plants, Insectivorous. See Insectivorous plants

Plants, Irritability and movements of Plant autographs and what they mean. il Sci Am 112:253+ Mr 13 '15 Scientific work of Prof. J. C. Bose. J. Kunz. Sci Am S 79:291 My 8 '15 Testing the sensibility of plants. J. C. Bose. il Sci Am S 79:244-6 Ap 17 '15

Plants, Poisonous. See Poisonous plants

Plaster and plastering
Bonding plaster coating to interior walls and
ceilings. Concrete Cem 6:36-7 Ja '15

See also Stucco

Plaster casts

Making the models and molds for ornamental concrete work—using plaster and gelatin, il Concrete Cem 6:150-1 Mr '15

se of glue molds under serious difficulties: reproduction of monuments at Quirigua, N. M. Judd. il Concrete Cem 6:151-4 Mr '15; Same. Sci Am S 80:56-7 Jl 24 '15

Plaster of Paris

How to use plaster of Paris. D. Gordon. Foundry 43:51 F '15

Plastering. See Plaster and pastering

**Plasticity** 

Atterberg plasticity method. C: S. Kinnison. U S Bur Stand Tech Pa 46:1-18 '15 Filing system in the chemistry of amorphous substances. W. K. Lewis. Met & Chem Eng 13:921 D 1 '15

Plasticity of clay and its relation to mode of origin, N. B. Davis, il Am Inst Min E Bul 98:301-30 F '15

Plate printing

late printing
Linotype slugs used as plate base. il Inland
Ptr 56:400 D '15
Making the plates for a modern newspaper
perfecting press. A. W. Birdsall. Inland Ptr
54:551-2 Ja '15
Reverse plate—its advantage to the printer.
J. L. Frazier. Inland Ptr 55:641-3 Ag '15
Standardization of the trimming of blocks for
engravings. F. W. Gage. il Inland Ptr 55:2469 My '15

Polates, Iron and steel
Bottom plates for pouring ingots. R. H. Irons.
ii Iron Age 96:1221-2 N 25 '15
Failure of British steel ship plates. W. J. B.
Wilson. ii Iron Age 95:610-12 Mr 18 '15; Abstract. Am Soc M E J 37:57-8 Ja '15
Magnet crane for handling steel plates. ii Iron
Tr R 57:492 S 9 '15
Parforated metal in Italy. Metal Work 84:211

Perforated-metal in Italy. Metal Work 84:211

Ag 13 '15 Surprising failure of steel ship plates. Int Marine Eng 20:50-1 F '15 See also Boiler plates

Plating

Advance in automatic plating machinery. M. Doyle, il Metal Ind n s 13:431-2 O '15 Economy of copper cyanide. C. Dittmar. Metal Ind n s 12:526 D '14 Keeping cost in a job plating shop. H. J. Ter Doest. Metal Ind n s 13:189 My '15 Metal cyanides. Metal Ind n s 13:474-5 N '15 Modern piece work system for a large plating department. C: H. Fleischer. Metal Ind n s 13:325-6 Ag '15 Modern plating department order system. C: H. Fleischer. Metal Ind n s 13:151-2 Ap '15 Modern plating reports.

Modern plating practice: a piecework system as used by the National cash register company. W. Fraine. il Metal Ind n s 13:1-4 Ja

Plating by impact. il diag Sci Am S 79:406 Je

Preparation of chemical salts: gold chloride, silver chloride, silver cyanide. C: H. Proctor. Metal Ind n s 13:10 Ja '15

Protective coatings for iron and steel. E. P. Later. Foundry 42:497-8 D '14

Simple and successful dip gilding solution. C: H. Proctor. Metal Ind n s 13:323 Ag '15

See also Copper plating; Electroplating; Galyanizing; Gold plating; Metal coating; Electroplating; Nickel plating; Silver plating

Platinum

Determination of platinum, palladium and gold. A. M. Smoot. Eng & Min J 99:700-1 Ap 17 '15

Flatinum Continued

Emissivity of metals and oxides; the total emissivity of platinum and the relation be-tween total emissivity and resistivity. P. D. Foote. U S Bur Stand Bul 11:607-12 My 27

Platinum in California. Eng & Min J 99:1045

Je 12 '15 Platinum in litharge, F. Michel, Eng & Min J 100:315 Ag 21 '15

Study of the quality of platinum ware with special reference to losses on heating. G: K. Burgess and P. D. Sale. il diags U S Bur Stand Bul 12:289-314, Bibliography. 314-16 N 8 '15; Same cond. J Ind & Eng Chem 7:561-4 Jl '15

Platinum plating
Gold and platinum plating; practical formulae
with instructions for their use. M. Kateridge.
Metal Ind n s 13:109-10 Mr '15

Plattsburg military camp Business men's training camp at Plattsburg, il Sci Am 113:182-3 Ag 28 '15

Player-piano rolls. See Piano player records

Playgrounds

lay ground construction at Boston, Mass.; itemized list of proposed expenditures. Eng & Contr 44:sup22-3 O 27 '15

Plimpton press, Norwood, Massachusetts Scientific management in the office. R. Kent. Iron Age 95:82-6, 142-4 Ja 7-14 '15

Pure electron discharge and its applications in diags Gen Elec R 18:334-9 My '15; Abstract. Elec W 65:1247 My 15 '15

Plows, Motor. See Motor plows

Plumbers

English writer lauds United States plumbers. B. Pain. Dom Eng 69:392 D 26 '14
Federal court ruling in the Des Moines case. Dom Eng 71:161-2 My 8 '15
Government prosecution of master plumbers. L. C. Boyle. Dom Eng 72:139-41 Jl 31 '15
National association of master plumbers in annual convention at Chicago. Dom Eng 72: 59-79 Jl 17 '15
National association of master plumbers 33d annual convention, Chicago, July 13-15. Metal Work 84:121-9 Jl 23 '15
New York plumbing apprentices. Metal Work

New York plumbing apprentices. Metal Work 84:464 O 8 '15

New York plumbing apprentices. Metal Work \$3::464 O 8 '15 Ohio master plumbers meet in convention. Metal Work \$3:302-4 F 19 '15 Plumber's contribution to civilization. E: F. Dunne. Dom Eng 69:389 D 26 '14 Relation of the plumber to the public. C: O. Walker. Dom Eng 71:35-6 Ap 10 '15 Report of Chicago master plumbers', sanitary committee. Dom Eng 72:136-7 J1 31 '15 Report of the special joint committee on plumbing apprenticeship in New York city. Dom Eng 72:371 S 25 '15 Women as successful master plumbers. B. H. Albee. il Dom Eng 73:71-2 O 16 '15 See also names of societies, e. g. National

See also names of societies, e. g. National association of master plumbers; New Jersey state association of master plumbers

Plumbing

Building construction and modern plumbing. J: L. E. Firmin, Metal Work 84:624-5 N 12

By-pass, dead-end and blind vent defined, diags Dom Eng 73:270-1 N 27 '15 Heating and plumbing in paint factory, il Metal Work 84:272-3 Ag 27 '15

Memories of bygone days. J: Troland. Dom. Eng 69:412-13 D 26 '14

Modern equipment in Detroit athletic club. diag plan Metal Work 84:37-9+, 73-6 diag pl 9-16 '15

Modern London plumbing supply house, il Met-al Work 83:186-8 Ja 29 '15

Modern methods of venting fixtures. J. Gra-ham. diags Dom Eng 71:302-4; 72:5-6 Je 12, Jl 3 '15

Modern plumbing in its relation to building. J: L. E. Firmin, Dom Eng 73:145-6 O 30 '15

National association of master plumbers sani-tary committee's report. Dom Eng 72:112-13 Jl 24 '15

Plumbing and heating in Burke home, il Metal Work 83:506-7+ Ap 2 '15
Plumbing and heating in California bungalow.
A. C. Shaver, il plan Metal Work 83:465-7+
Mr 26 '15

Plumbing and heating in Cincinnati hospital.
K. C. Cardwell, il plan Dom Eng 71:212-14
My 22 '15

Plumbing and its relation to public health. W: C. Groeniger. Metal Work 83:415-16+ Mr 19 '15

Plumbing equipment in Jersey high school, il Metal Work 84:77+ Jl 16 '15 Plumbing equipment in Loomis institute, Windsor, Conn. il diags plan Metal Work 83:323-6 F 26 '15

83:323-6 F 26 15 Plumbing equipment in mercantile building. il diags Metal Work 82:797-9 D 18 '14 Plumbing equipment of Montclair, N. J., high school. il plan Metal Work 84:483-4+ O 15

school. il plan Metal Work 84:483-4+ O 15
'15
'Plumbing equipment of swimming pool, Louisville, Ky. il plan Metal Work 83:288-90 F 19
'15; Same. Bldg Age 37:39-40 JI '15
'Plumbing in a suburban residence. J. Graham. plans Dom Eng 70:68-70 Ja 16 '15
'Plumbing in eastern district Y. W. C. A. il plan Metal Work 83:835-6+ Je 11 '15
Plumbing installation and sewage disposal. C: A. Whittemore. diags Brickb 24:81-4, 11518, 137-40, 171-3, 197-200 Ap-Ag '15
Plumbing installation in movie theater. il plan Metal Work 84:99-100 J1 23 '15
Plumbing practice in southern Australia. Metal Work 83:508+ Ap 2 '15
Plumbing system in Bridgeport bank building. il Metal Work 84:462-3 O 8 '15
Plumbing system in Seamen's church institute. il Metal Work 83:412-14 Mr 19 '15
Plumbing system of modern office building. il plan Metal Work 84:279-80 Ag 27 '15
Plumbing system of public market station. il plan Metal Work 84:555-7 O 29 '15
Plumbing work in Harvard club of New York. il plan Metal Work 84:4605-7 N 12 '15
Plumbing work in Kentucky high school. il Metal Work \$1:162-7 Color of New York. il plan Metal Work \$1:46-8 JI 30 '15
Typical country plumbing installations. il plans Bldg Age 37:57-60 JI; 61-4 Ag '15
Typical restaurant plumbing system. G. D. Crain, jr. il plans Metal Work 82:727-9 D 4 '14
Water supply, plumbing and sewage disposal

Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:286, 313-15, 338-40 S 4-18 '15

See also Bath rooms; Drainage, House; Gas fitting; Hot water supply; Plumbing fixtures; Plumbing trade; Sanitary engineering; Sewer gas; Shower baths; Toilet rooms; Water

#### Standards

Need of a national plumbing code. T: J. Claffy. Dom Eng 71:247-9 My 29 '15; Same. Metal Work 83:875-7 Je 18 '15

# Study and teaching

Sheet metal and plumbing work exhibited. il Metal Work 84:546-7 O 29 '15 Training the master plumber's apprentice. W. A. Fink. Metal Work 83:888-9 Je 18 '15

#### Traps

Construction and action of grease traps. diags Dom Eng 70:11 Ja 2 '15

Different types of grease traps. J. Graham. diags Dom Eng 72:369-71 S 25 '15 Drum trap and its types. J. Graham. diags Dom Eng 72:30-2 JI 10 '15

Location of the grease trap. diags Dom Eng 71:339-40 Je 19 '15

Plumbing installation and sewage disposal. C: A. Whittemore. diags Brickb 24:115-16 C: A. My '15

Sand and oil trap for garage. diag Metal Work 84:523 O 22 '15

Plumbing fixtures Hidden fixture overflows a menace. S. C. Fred-ericks. Metal Work 83:838 Je 11 '15

Plumbing fixtures—Continued
Kohler company shows the plumber what he
can purchase. il Metal Work 83:447-8 Mr 19

Novel bath tub and wash stand. C. L. Edholm. il Metal Work 84:588 N 5 '15 Plumbing installation and sewage disposal. C: A. Whittemore. diags Brickb 24:116-18 My '15

See also Water closets

Plumbing laws and regulations

Plumbing laws and regulations
Important plumbing legislation pending in Ohio.
Dom Eng 70:405 Mr 27 '15
Los Angeles secures new plumbing ordinance.
Dom Eng 72:27 J1 3 '15
Massachusetts supreme court hands down decision favoring permit to journeyman plumber. Dom Eng 69:288 D 5 '14
Master plumbers scrutinize proposed plumbing laws for Massachusetts. Dom Eng 71:222 My
Need of a rotice of the proposed of the pro

22 '15
Need of a national plumbing code, F. J. Hanley. Dom Eng 72:176-8 Ag 7 '15
Need of a national plumbing code, T: J. Claffy, Dom Eng 71:247-9 My 29 '15; Same, Metal Work 83:875-7 Je 18 '15
New plumbing law for Oklahoma, Dom Eng 72:259-60 Ag 28 '15

New plumbing law for Oklahoma. Dom Eng 72:259-60 Ag 28 '15
New plumbing ordinance for Manchester, Conn. Dom Eng 73:178-80, 205-6 N 6-13 '15
New plumbing ordinance for Marietta, O. Dom Eng 70:114 Ja 23 '15
Pasadena plumbing code and the chief sanitary inspector. W. R. Marshall. Dom Eng 70:338-9 Mr 13 '15
Plumbing bill pending before Oklahoma state legislature. Dom Eng 69:334 D 12 '14
Plumbing law requires competence. Metal Work 84:132-3 Jl 23 '15
Plumbing standards and local regulations, il diags Metal Work 83:691-2 My 14 '15
Proposed plumbing law for Pennsylvania. Dom Eng 71:279-80 Je 5 '15
Proposed plumbing laws for Massachusetts. Dom Eng 71:158-9 My 8 '15
Proposed state law for licensing steam-fitters in Iowa. Dom Eng 70:308-9 Mr 6 '15
Rain water leaders. E. R. Porter. diags Dom Eng 73:230-1 N 20 '15
Sanitary regulations in Canada. Metal Work 83:543 Ap 9 '15
Should plumbing laws be enacted by state or city? E. R. King Metal Work 82:30-1

Should plumbing laws be enacted by state or city? F. R. King. Metal Work 83:229-31 F 5

Texas district court decides house owner can install own plumbing. Dom Eng 73:111-12 O

Plumbing shops
Clearing the way for the season's business.
il Metal Work 83:427-9+ Mr 19 '15
Cleveland showroom for sanitary goods. il
Metal Work 83:522-3 Ap 2 '15
Combination shop can best serve community.
il Metal Work 83:85-8+ Ja 8 '15
Combination shop in Lake Villa, Ill. il Metal
Work 84:265-6+ S 17 '15

Combination shop in Lake Villa, Ill. il Metal Work 84:365-6+ S 17 '15
Combination shop in southern Australia. Metal Work 83:92 Ja 8 '15
Combination shop of convenient arrangement. il plan Metal Work 83:57-9 Ja 1 '15
Combination shop sets example in system. il Metal Work 83:434-5 Mr 19 '15
Master plumber and the show window. il Metal Work 83:319-50 Mr 5 '15
Money in combination shop's window display. il Metal Work 84:154-5 O 8 '15
Money in combination shop's window display. il Metal Work 84:154-5 O 8 '15
Photos advertise combination shop's products. il Metal Work 84:151-5 O 8 '15
Successful management of combination shop. il Metal Work 83:815-16 Je 4 '15
Window observers are future customers. il Metal Work 84:672 N 26 '15

Plumbing supplies
Among the exhibitors and salesmen. il Dom
Eng 72:80-90 Jl 17 '15

Eastern supply association's summer meeting. Dom Eng 71:377-9 Je 26 '15

Handling of malleable fittings. W: J. Woolley. Dom Eng 72:107-9 Jl 24 '15

Judicious buying of plumbing materials. Met-al Work 83:59-60 Ja 1 '15

Meeting of the Eastern supply association; list of those in attendance. Dom Eng 70:282-3 F 27 '15

Modern London plumbing supply house. il Met-

ai Work 83:184-8 Ja 29 15 New goods at Master plumbers' convention. il Metal Work 84:221-7 Ag 13 '15 Plumbing supplies and jobbers' problems. L. O. Koven. Metal Work 84:589 N 5 '15 67th meeting of the Central supply associa-tion; list of members represented. Dom Eng 70:283-4 F 27 '15

See also Heating apparatus

tion; itst of members represented. Dom Eng 70:283-4 F 27 '15

See also Heating apparatus

Plumbing trade

Annual congress of the trade. Dom Eng 69: 415-35+; 70:13-15 D 26 '14, Ja 2 '15

Beginner's troubles in plumbing work. F. W. Page. Metal Work 83:290 F 19 '15

Better business building blocks. G. R. Adams. Dom Eng 73:105-7, 143-4 O 22-30 '15; Same cond. Metal Work 84:533-5 O 22 '15

Building plumbing trade by mail. H. Whitehead. Dom Eng 71:6-9 Ap 3 '15

Business depression and the plumbing trade. S. L. Barnes. Metal Work 84:130-1 Jl 23 '15

Business methods for the master plumber. W. A. Fink. Dom Eng 65:70-1, 107-8, 169-70, 206-7, 267-9, 306-7, 373; 66:40-1, 170-1, 299-300; 67:6-7, 64-5, 264-5; 68:7-8, 160, 254-5, 358-9, 392; 69:13, 70-1, 130-1, 200, 269-70, 231-2, 368-9; 70:42-2, 103, 204-5, 273-4, 369; 71:34-5, 101-2; 72:171-2, 227-8, 343-4 O 18-25, N 8-15, 29 D 6, 20 '13, Ja 10, F 7, Mr 7, Ap 4, 18, My 30, Jl 4, Ag 8, 29, S 19, 26, O 3, 17, 31, N 14, 28, D 12-19 '14, Ja 9, 23, F 13, 27, Mr 20, Ap 10, 24, Ag 7, 21, S 18 '15

Constructive publicity for the plumbing trade. Dom Eng 73:206-7 N 13 '15

Credit systems for plumbers and fitters. W. A. Fink. Dom Eng 73:9-10, 169-70, 297 O 2, N 6, D 4 '15

How one master plumber was successful. Metal Work 33:55-6 Ja 1 '15

How service may be right arm of success. G. R. Adams. Dom Eng 70:77 Ja 16 '15

Manufacturers and aggressive sales seekers. il Metal Work 83:55-6 Ja 1 '15

Manufacturers and aggressive sales seekers. il Metal Work 83:50-2 Ja 1 '15

Mater plumbers' idea of profit in labor. H. F. Baillet. Metal Work 83:57-2 Ja 1 '15

Motor trucks and business efficiency, il Metal Work 83:50-2 Ja 1 '15

Office helps for the master plumber. J; F. Scott. Dom Eng 71:66-7; 72:7-8 Ap 17, JI 3 '15

Questioning the plumber's bill. Dom Eng 73: 175 Questioning the plumber's bill. Dom Eng 73:

Questioning the plumber's bill. Dom Eng 73:

Questioning the plumber's bill. Dom Eng 13: 197 N 13 '15
Retired plumber's advice to beginners. D. L:
Hanson. il Dom Eng 68:224-6; 69:104-6, 192-4, 324-6, 401-3; 70:236-8, 406-8; 71:98-100, 250-2; 72:257-8, 372-4; 73:138-40, 268-70 Ag 22, O 24, N 14, D 12, 26 '14, F 20, Mr 27, Ap 24, My 29, Ag 28, S 25, O 30, N 27 '15
Selling helps that have proved effective. Metal Work 83:2-9 1a '15
Standard prices for standard services. W. E. Clow. Metal Work 83:254 F 12 '15
Strength and weakness in the master plumber. W: J. Woolley. Metal Work 83:89-91+ Ja 8 '15

uccessful merchandising for the plumber. H. Whitehead. Dom Eng 70:5-6, 78-9 Ja 2, 16 '15 Successful

Training the master plumbers' apprentice. W. A. Fink. Metal Work 84:30-1 Jl 2 '15 See also Plumbing fixtures; Plumbing shops; Plumbing supplies

# Accounting

Business methods for the plumber and fitter. W. A. Fink. Dom Eng 71:185-6 My 15 '15

Cost accounting in plumbing establishments. H. G. Helstrum, Metal Work 83:53-4 Ja 1 '15 Cost system of Denver combination shop. J. R. Elliott. Metal Work 84:274-8 Ag 27 '15

Merchant plumber's overhead expense. J: J. Foy. Metal Work 83:251-3 F 12 '15

Overburdening the overhead expense. Whitehead. Dom Eng 72:317-18 S 11 '15

Plumbing trade—Accounting—Continued

Overhead expense per man per hour. W. A. Fink; R. H. Pflug-Felder. Dom Eng 71:335-6 Je 19 '15
Practical cost system for combination shop.
Metal Work 84:306, 340+, 361+, 397-8 S 3-24

What is cost of material and labor? W. A. Fink, Dom Eng 72:105-6 Jl 24 '15

### Advertising

Assisting the trade in newspaper advertising, il Dom Eng 73:272-4 N 27 '15

Business methods for the plumber and fitter, W. A. Fink, Dom Eng 69:331-2; 70:42-3, 273-4; 71:101-2 D 12 '11, Ja 9, F 27, Ap 24 '15

Interesting the farmer in good plumbing, J. A. Owens, Dom Eng 72:287-8 S 4 '15
Seasonable show window advertising, L. Axworthy, Metal Work 84:658 N 19 '15
Show room advertising for merchant plumbers, C: G. Perry, Metal Work 83:839-40 Je

ers. (

Where to dig for fall profits, il Metal Work 84:267-71 Ag 27 '15

Plumboxan

Plumboxan process for producing oxygen and nitrogen from atmospheric air: abstract. G. Kassner. Am Soc M E J 37:119 F '15

Pneumatic hammers

Air drill does duty as steam hammer in black-smith shop. W. Bazore, il Eng Rec 72:270 Ag 28 '15

Barr pneumatic light forging hammer. il Ind Eng 14:422 N '14; Ry Age (Mech ed) 89:147-8 Mr '15

Pneumatic hammer, il diags Ry Age (Mech ed) 89:586-7 N '15

Pneumatic pumps. See Air pumps

Pneumatic signals

Improvement in the operation of the pneumatic signal device. L. N. Armstrong and H. L. Sandhas, diags Ry R 56:618-21 My 8'15

Pneumatic tires. See Tires (automobile)

Pneumatic tools

Compressed air as source of power: advantages of pneumatic power tools. C: C. Phelps. Metal Work 82:822+ D 25 '14 Cost of compressed air. T: F. Crawford. Ry Age (Mech ed) 89:364-5 Jl '15

Lubrication of pneumatic tools. Ry R 57:276-7

Ag 28 Maintenance of pneumatic tools. il Ry Age (Mech ed) 89:413-15 Ag '15

Pneumatic plate flanging clamp, il Iron Tr R 56:271 F 4 '15

Pneumatic tie peeler. il Ry Age 59:342 Ag 20

Tool-om-eter. il diag Int Marine Eng 20:186-7

Ap '15 See also Pneumatic hammers: Tamping

machines

Pneumatic tubes
Pneumatic grain elevating plant. il diag (supp)
Engineer 120:361, 366 O 15 '15

Telegraph traffic and power plant for pneumatic tubes in post offices; abstract. A. B. Eason. Am Soc M E J 37:418-19 Jl '15 See also Waste removal

Pneumatics

Action of an air jet on the surrounding air; abstract. T. Trüpel. Am Soc M E J 37:283-5 My 15

Can we locate the neutral zone in heated buildings? J. J. Blackmore. diags Heat & Ven 12:27-32 N '15

See also Air; Gases

## Pocatello, Idaho

Water supply

Regulation of water rates. Munic Eng 47:457-D '14

Poisonous gases. See Gases, Asphyxiating

Poisonous plants

Cicutoxin; the poisonous principle in water hemlock (cicuta). C. A. Jacobson. il Am Chem Soc J 37:916-34 Ap '15

Poland

Industries and resources

Mines and smelting works of Poland. il map Eng & Min J 99:146-8 Ja 16 '15

Polar exploration. See Arctic exploration

Polaris

Azimuth observations on Polaris by daylight. R. V. R. Reynolds. Eng N 737779 vp 22 (15) Same. Eng & Min J 99:776 My 1 '15

Polarity

Polarity reversal in synchronous converters. E. R. Shepard, diags Elec W 65:210-11 Ja 23

Some transformer connections. G. Fox. diags Power 41:46-8 Ja 12 '15

Polarity tester

New polarity tester. diag Engineer 118:550 D

11 '14; Same. Elec W 65:102 Ja 9 '15

Corrugated iron protectors for trans-continental telephone line poles in Lake Humboldt, Nev. il Eng & Contr 44:27 Jl 14 '15 Destruction of cement sidewalks by trolley poles. C. H. Fuller. Elec Ry J 46:832-3 O 16

Determination of annual charge for ties, poles and fence posts. W. F. Goltra. Ry Age 58: 1087 My 21 '15
Effect of preservatives on wood poles. F. L. Rhodes and R. F. Hosford. Elec Ry J 46:879 O 23 '15
Laws of deterioration of telegraph poles; abstract. F. Moll. Am Soc M E J 37:653-4 N '15

Preserving and reinforcing decayed wooden poles with concrete, Concrete Cem 6:19 Ja

Raising a 135-ft. flagpole with electric trucks. il Elec W 66:595 S 11 '15
Reinforcing metal poles. G. H. M'Kelway. Elec Ry J 46:365-7 Ag 28 '15
Reinforcing wood poles with railroad rails. J. Orchiston. diags Elec W 66:172 Jl 24 '15
Reinforcing wood poles with steel channels. L. R. W. Allison. il Elec W 66:1207 N 27 '15
Repairing broken tubular iron poles. S. L. Foster. diag Elec Ry J 46:450-1 S 11 '15
Results obtained from the preservative treatment of telephone poles. F. L. Rhodes and R. F. Hosford, bibliog il Am Inst E E Pro 34:2343-87 O '15; Abstract. Elec W 66:1031 N 6 '15

Simplex pole jack, il Elec R & W Elec'n 67; 683 O 9 '15; Elec W 66:827 O 9 '15 Speedy and inexpensive pole moving in San Francisco. S. L. Foster, il Elec Ry J 46:874

See also Electric lines; Street lighting fix-

Poles, Concrete
Combined concrete poles and lighting standards, il Elec W 65:739-40 Mr 20 '15
Concrete lighting standards for bridges at
Houston, Texas. W. W. Washburn, il diags
Concrete Cem 6:123-4 Mr '15

Concrete Cem 6:123-4 Mr '15
Concrete lighting standards made attractive.
L. R. W. Allison. Il Eng N 74:1080 D 2 '15
Concrete poles in electric railway work. diags
Ry R 57:487-9 O 16 '15
Concrete posts and poles; report to the American railway bridge and building association.
G: E. Boyd. Ry R 56:360-2 Mr 13 '15
Concrete transmission-line poles. R. D.
Coombs. il Elec W 65:341-3 F 6 '15
Concrete transmission poles. A. R. Holliday.
il Elec W 66:237 Jl 31 '15
Design and construction of a concrete idler stand. H. H. Hunter, diags Eng & Contr 44:
413-14 N 24 '15
Electrolysis develops defects in but three out of 1500 concrete poles. H. G. Throop. Elec Ry J 45:294 F 6 '15
Manufacturing reinforced concrete poles or piles by rolling, diag Concrete Cem 6:265-6
My '15
Reinforced-concrete flag-pole at Panama.

My '15
Reinforced-concrete flag-pole at Panama.
G. C. Dobson, il diag Eng N 74:452-3 S 2 '15
Reinforced concrete poles for railways, il diag
Elec Ry J 44:1923 D 5 '14
Report on concrete poles for electric railways.
Eng N 74:943 N 11 '15
Tall concrete poles have given nine years' service, il Eng Rec 71:550 My 1 '15

Poles, Steel Climbers for structural-steel poles, il diag Elec Ry J 46:1049 N 20 '15 Expanded metal poles replace two wooden pole lines, il Elec Ry J 46:1090-1 N 27 '15 New type of steel pole, il Elec Ry J 46:32 Jl 3

Stell pole strength per pound increased il diags Elec Ry J 46:370 Ag 28 '15; Elec W 66:549 S 1 '15

Future of the police arm from an engineering standpoint; with discussion. H; Bruère. Am Soc M E J 37:77-81 F '15; Same. Sci Am S 19:174-5 Mr 13 '15

Municipal police departments—their relative size. A. L. Bostwick. Munic Eng 48:141-2 F Police

Sizes of police departments. Munic J 38:315-16 Mr 11 '15

Police alarms

Signal box records, P. I. Patton, Munic J 39; 397-8 S 9 45

Police patrol Motorized police department, K. C. Cardwell, il Munic J 38:316-17 Mr 11 '15

Polishing. See Grinding and polishing

Polishing wheels. See Grinding and polishing

Ponce de Léon, Juan, 14602-1521 First mining engineer of the western hemis-phere. Eng & Min J 99:274 F 6 '15

Pontianak rubber resin. See Gums and resins

Pontoon bridges

Building bridges under fire. M. Wells. il Sci Am 11:456-7 D 5 '14 Pontoon bridges and rafts. il Sci Am S 80:116

Pontoon railroad bridge across the Panama canal diags Ry R 56:82-4 Ja 16 '15

Pontoon swing-bridge over the Panama canal. Eng N 73:126 Ja 21 '15

Swinging pontoon bridge carries railroad across Panama canal, diags Eng Rec 71; 270-1 F 27 '15

Pontoon for building Memphis bridge caissons, diags Eng N 73:1037 My 27 '15 Pontoons

Pontoons, Concrete Reinforced concrete pontoon. O. Johnson. il Sci Am 111:505 D 19 '14

Poor farms. See Almshouses Poorhouses. See Almshouses

Porcelain

American-made porcelain ware for chemical laboratories, il Met & Chem Eng 13:461 Jl

frequency oscillator. II. The problematical points of manufacture. III. Experiences and experimental investigations. E. E. F. Creighton. il Am Inst E E Pro 34:753-841 My '15; Abstract and discussion. Elec R & W Elec'n 66:395-6 F 27 '15; Elec W 65:528 F 27 '15; Discussion. Am Inst E E Pro 34:2622-45 N '15

High-frequency oscillator for porcelain-insulator testing, il diag Elec R & W Elec'n 66: 880-1 My 8 '15

Model porcelain factory in Kiangsi. Metal Work 84:586 N 5 '15

Viscosity of porcelain bodies high in feldspar. A. V. Bleiminger and C. S. Kinnison. U. S. Bur Stand Tech Pa 50:1-7 '15; Abstract. Metal Work 84:526 O 22 '15 See also Pottery

Early American architectural details: Tucker-Rice porch, Salem, Mass. Brickb 24:pl 1 Ja Porches

Porphyry coppers. P. E. Barbour. Eng & Min J 99:1111-12 Je 26 '15

Portable buildings. See Buildings, Portable Portable railroads. See Railroads, Portable Portable schoolhouses, See Schoolhouses, Portahle

Portable towers. See Towers, Portable

Portage silica company

How the Portage silica co. prepares its product to meet the requirements of the foundry trade, il Foundry 48:36-7+ Ja '15

Porter, Rufus Founder of the Scientific American. R: At-water. Sci Am 112:493 My 29 '15

Portland, Maine

Bridges

Construction details of bridge across Portland harbor, il diag Eng N 74:865-8 N 4 '15 Portland harbor bridge, il diags plan Eng N 74:824-9 O 28 '15

Portland, Oregon
Portland's municipal testing laboratory. H.
White, il Munic J 39:808-9 N 25 '15

Bridges

Interstate bridge over the Columbia river. E. E. Howard, diags Eng N 73:1218-21 Je 24

Pacific highway interstate bridge over the Columbia river and its approaches between Vancouver, Wash., and Portland, Ore. E. E. Howard. diags Eng & Contr 43:540-3 Je 16

Portland viaduct, W. B. Conant. il diags Munic J 39:499-502 S 30 '15

Bureau of photography

Municipal department for copying records, photographing pavements, sewers and other public works. H. M. White. il Munic J 39: 577-8 O 14 '15

Harbor

Panama canal and the ports of the Pacific A. J. Quigley. il map Eng M 48:808-11 Mr '15

Rapid transit

Effect of publicity on the jitney movement in Portland, F. W. Hild, Elec Ry J 46:560-1 S

raffic analysis and schedule planning at Portland, F. Cooper. Elec Ry J 46:562-4 S Traffic

Streets

Portland street corner directories. Munic J 39: 7 Jl 1 '15

Water supply

Method and cost of constructing and repairing submerged water pipe lines at Portland, Ore. D. D. Clarke, diags Eng & Contr 42:538-42 D 9 14

Portland cement. See Cement

Portland railway, light & power company Portland valuation brief filed. Elec Ry J 46: 922 O 30 '15

Ports

bevelopment of port of Boston, map Eng & Contr 43:sup29 Je 16 '15
Panama canal and the ports of the Pacific,
A. J. Quigley, il maps Eng M 48:493-7, 64157, 808-26; 49:1-17 Ja-Ap '15
Port development at Seattle, P. P. Whitham, il diags map Eng N 73:476-81 Mr 11 '15
Port improvements along the Mississippi and Ohio rivers, Eng N 73:1066-8 Je 3 '15
To make Nottingham a port, Sci Am S-79:342
My 29 '15

See also Freight handling: Harbors, Diography

See also Freight handling; Harbors; Piers; Terminals

Post office buildings

ost office buildings
Business principles in constructing public buildings. Eng Rec 72:161 Ag 7 '15
Heating equipment of federal building, Denver. il Metal Work 84:247-9+ Ag 20 '15
Mechanical equipment of the Grand Central post office. H. T. Wade. il Sci Am 113:232-3 S 11 '15

Wew post office, Washington, D. C. il Arch & Bldg 46:423-9 N '14 Sew post office, Washington, D. C.; views. Arch Rec 37:278-80 Mr '15

Post office, New Orleans, La. J il Arch & Bldg. 47:131-6 Ap '15 J. G. Rogers.

Postal rates
In re third-class postage, R. H. Booth, Inland Ptr 56:101 O '15

#### Postal service

See also Mail handling, Parcel post; Railway mail service

#### Germany

German post office and the German army. A. Gradenwitz. il Sci Am 113:25+ Jl 3 '15

Postal service, Military
German post office and the German army. A.
Gradenwitz. il Sci Am 113:25+ Jl 3'15

Posters Specimens of posters. Inland Ptr 54:656a-656h

Constructing stair newel posts. C. L. Oakley. diags Bldg Age 37:71 Ag '15

See als: Fence posts; Lamp posts

### Posts, Concrete

B. R. & P. concrete sign and post plant, diags Ry Age 58:1434-5 Je 18 '15 Concrete posts for grape trellis, il Bldg Age 37:69 N '15

How concrete lamp-posts are made for Lincoln park, Chicago. G: T. Donoghue. il diag Eng N 74:959 N 18 '15

See also Fence posts, Concrete

#### Potash

Agriculture in Germany and significant facts about potash. Sci Am S 80:167 S 11 '15 Business aspect of the kelp proposition. F: P. Dewey. Sci Am S 79:71 Ja 30 '15

Cushman-Coggeshall method for potash. G. W. Coggeshall. Eng M 49:578 Jl '15 Doing without Europe. Sci Am 112:157+ F 13

Johns without Entrope. Set Am 112:151+ F 13
15
Drilling costs in potash prospecting. E. E.
Free. Eng & Min J 100:108-9 Jl 17 '15
European war and potash supplies. T: J.
Keenan. Sci Am S 79:86 F 6 '15
Extracting potash from salines of low potash
content. Eng & Min J 100:224 Ag 7 '15
Feldspar as a possible source of American potash. A. S. Cushman and G. W. Coggeshall.
J Ind & Eng Chem 7:145-51 F '15; Same. Met
& Chem Eng 13:99-104 F '15
German and other sources of potash supply.
C: H. Macdowell. Am Inst Min E Bul 98:10314 F '15; Abstract. Met & Chem Eng 13:179
Mr '15; Discussion. Am Inst Min E Bul
101:1118-19 My '15
Investigation of sources of potash in Texas.
W: B. Fhillips. Il Am Inst Min E Bul 98:
115-27 F '15
Possible source of potash. Eng & Min J 100:

115-27 F '15
Possible source of potash. Eng & Min J 100:
877 N 27 '15
Possible sources of potash in the United
States. A. H. Rogers. Met & Chem Eng 13:
387-8 Je '15
Potash deposits in Chile. S. Salcedo. Eng &
Min J 100:218 Ag 7 '15
Potash from leucite. A. H. Rogers. Eng M 49:
575.6 B 1'15

7575-6 JI '15
Potash from wood and plant ashes. H. Bradley, diag Met & Chem Eng 13:841-6 N 15 '15
Potash in Texas. J. A. Udden. Eng M 49:577

Potash situation. E: Hart. J Ind & Eng Chem 7:679-1 Ag '15; Excerpt (New process) Eng N 74:616 S 23 '15
Potash situation. J. W. Beckman, Met & Chem Eng 13:582 S 15 '15

Potash situation. S; H. Dolbear. Met & Chem Eng 13:481-2 Ag '15

Potassium salts; an economic geological study. E. M. Heriot. il maps Eng & Min J 100:669-72, 712-14 O 23-30 '15

Producing potash in Utah. Eng & Min J 100: 688-9 O 23 '15

Searles Lake (Cal.) patent protest. Eng & Min J 99:334-5 F 13 '15

Spanish potash deposits. Eng & Min J 100:262 Ag 14 '15

Potassium
Perchloric method of determining potassium
as applied to water analysis. C. Scholl. Am
Chem Soc J 36:2085-9 O '14

Potassium ammonoargentate Action of potassium amide solution on silver amide. E: C. Franklin. Am Chem Soc J 37: 852-5 Ap '15

## Potassium ammonobarate

Potassium ammonobarate, ammonostrontiate and ammonocalciate. E: C. Franklin. Am Chem Soc J 37:2295-301 O '15

# Potassium ammonocalciate

Potassium ammonobarate, ammonostrontiate and ammonocalciate. E: C. Franklin. Am Chem Soc J 37:2295-301 O '15

# Potassium ammonostrontiate

Potassium ammonobarate, ammonostrontiate and ammonocalciate. E: C. Franklin. Am Chem Soc J 37:2295-301 O '15

Potassium bitartrate. See Cream of tartar

Potassium carbonate, See Potash

#### Potassium chloride

Potassium chloride concentration cells. D. A. MacInnes and K. Parker. diags Am Chem Soc J 37:1445-61 Je '15
Solubility of mixtures of sodium and potassium chlorides in solutions of hydrochloric acid. W. F. Hicks. diag Am Chem Soc J 37:844-7 Ap '15

Potassium cyanide Blacksmith's use of borax and cyanide. Eng & Min J 99:1076 Je 19 '15

#### Potassium dichromate

oxidation and reduction without the addition of acid; the reaction between ferrous sulfate and potassium dichromate. M. Neidle and J. C. Witt. Am Chem Soc J 37:2360-8 O '15

### Potassium iodate

Oxidation of sulfides with potassium iodate, R. S. Dean. Am Chem Soc J 37:1134-7 My

# Potassium iodide

Study of the system: water, potassium iodide and iodine at zero degrees. G. Jones and M. L: Hartmann. Am Chem Soc J 37:241-58 F '15

# Potassium permanganate

Making up standard permanganate solution. H. E. Moyer. Eng & Min J 100:522 S 25 '15

# Potassium phthalate

Acid potassium and acid sodium phthalates as standards in acidimetry and alkalimetry. W. S. Hendrixson. Am Chem Soc J 37:2352-9 O '15

# Potentiometers

otentiometers
Alternating-current potentiometer; abstract.
C: V. Drysdale, diag Elec W 65:1554 Je 12 '15
Leakage prevention by shielding, especially in potentiometer systems. W. P. White, diags
Am Chem Soc J 36:2011-20 O '14
Potentiometers for thermoelectric measurements especially in calorimetry. W. P. White, diags Am Chem Soc J 36:1868-85 S '14
Testing of potentiometers. F. Wenner and E. Weibel, il diags U S Bur Stand Bul 11:1-40
N 15 '14

## Pottery

ottery

Pottery industry; report on the cost of production in the earthenware and china industries of the United States, England, Germany, and Austria. U S Bur For & Dom Com misc ser 21:1-709 '15; Excerpt. Sci Am S 79:263 Ap 24 '15

Probable effect of the war in Europe on the ceramic industries of the United States.

A. S. Watts. U S Bur Mines Tech Pa 99:1-14

See also Clay; Porcelain; Tiles

Poultry feeders Automatic poultry feeder, il Sci Am 113:49 JI 10 '15

# Poultry houses

Constructing a poultry house. J. D. Griffen, plans Bldg Age 37:62-3 Ja '15
Million chicks to the acre; raising poultry on a manufacturing basis. M. Hastings. il Sci Am 113:247+ S 18 '15

# Powder. See Explosives-Storage

Powder, Smokeless. See Smokeless powder

Powdered coal. See Coal, Pulverized

#### Power

Wer with discussion. R. P. Bolton. Am Soc Heat & V E 20:374-91 '14
Power formulas for machine tools. A. D. Du-Bois. Elec W 65:928-33 Ap 10 '15

Power -- Continued

ower requirements of ammonia compressors. W. N. McKee. Power 41:158-60 F 2 '15 Selecting construction power-plant system. Eng N 74:965-7 N 18 '15 Steam versus air for power tools. Metal Work 82:796+ D 18 '14

See also Compressed air; Electric power; Engines; Force and energy; Horsepower; Hydroelectric power; Machinery; Mechanics; Mining engineering—Power; Pneumatic tools; Power cost; Power plants; Power transmission; Steam; Units; Water power

Power cost

ower cost
Cleveland's municipal electric light plant. il
diags Munic J 38:869-75 Je 24 '15
Controlling the cost of electricity. W. N.
Polakov. Eng M 49:235-40 My '15
Cost of a kilowatt-hour; explanation of
terms and elements involved in power generation. A. F. Strouse. Eng M 48:278-80 N
'14; Same. Eng & Contr 42:555 D 16 '14
Cost of combination electric service; investigation at Calgary, Alberta. Elec W 65:11813 My 8 '15
Controlling the property of the projection of 
3 My 8 '15
Cost of electric pumping for irrigation. il map Elec W 66:68-71 Jl 10 '15; Same cond. Eng Rec 72:257-8 Ag 28 '15
Costs in small industrial power plant, C. W. Thayer. Power 41:465-6 Ap 6 '15
Costs of power relative to total manufacturing costs in various industries; abstract. H. E. McKensit. Ind Eng 14:468-9 D '14
Decision by Oregon commission, with table of costs for different classes of consumers of the Hood River gas and electric company. Elec W 66:431 Ag 21 '15
Diesel-engine central station at Winchester, Ind. T: Wilson. il Power 41:562-4 Ap 27 '15

iesel engine for the contractor—why not? H. D. Hammond, il Eng Rec 71:409-10 Mr 27 '15

27 '15 Distributing overhead expense, N: T. Ficker. Eng M 49:862-71 S '15 Electrically operated contractor's plant for building Kensico dam. A. W. Carroll, il Eng Rec 71:18-20 Ja 2 '15

Rec 71:18-20 Ja 2 '15 Electricity in grain elevators. H. E. Stafford. il diags Am Inst E E Pro 34:1087-1103 Je '15; Abstract. Elec W 66:90 JI 10 '15 Electricity in implement manufacturing. W. J. Kyle. il Elec R & W Elec'n 67:97-101 Jl 17

Former engineer of La Salle hotel defends his administration. J. E. Lawrence, Power 41: 63-5 Ja 12 '15

Gas and steam engines and the turbine. J. E. Johnson, jr. Iron Age 95:626-9 Mr 18 '15; Same. Sci Am S 79:294-5 My 8 '15 Gas-power plant of the Illinois glass co. at Alton. T: Wilson. il plan Power 42:252-6 Ag 24 '15

German power-cost estimates, L. Schulte.
Power 42:714 N 23 '15
Graphic analysis of steam-electric power tologous J. Wilmore, Elec W 66:189 Jl 24 '15
Holyoke gas and electricity, Munic J 38:258
How to select

How to select your prime mover. G. Fisk. Iron Tr R 57:569-72+ S 23 '15

How to select your prime mover. G. Fisk. Iron Tr R 57:569-72+ S 23 '15

Hydroelectric development; with discussion. H; Flood, jr. Elec W 65:1267-9 My 15 '15

Multiplex cost and rate system. O: B. Goldman. Am Inst E E Pro 34:941-57 My '15; Discussion. 34:2662-5 N '15

Discussion. 34:2662-5 N '15

Power costs in a tenant building. A. A. Winter. Power 41:406 Mr 23 '15

Power with by-product recovery. T. R. Wollaston. Engineer 119:326-7 Ap 2 '15; Same. Sci Am S 80:42-3 J1 17 '15

Reduction of power costs in a factory power plant. T. K. Roberts. diags Ind Eng 14:445-50 D '14

Relative costs of steam and hydro-electric

D'14
Relative costs of steam and hydro-electric power. Power 41:246 F 16 '15
Saving in Federal building plant, Chicago. Power 41:610-11 My 4 '15
Selecting construction power-plant system. Eng N 74:965-7 N 18 '15

Selling current on a small margin; a small water and steam plant, T. Wilson, il diags Power 42:498-501 O 12 '15

Small isolated plant pays big dividends. T: Wilson, il Power 41:51-4 Ja 12 '15
Small-town distribution and management cost. E. A. Wright, Elec W 65:338-41 F 6 '15
Steam versus electricity in a corset factory. Elec W 65:110 Ja 9 '15
Uniform electric rates based on costs. H: D. Jackson. Elec W 66:236-7 J1 31 '15
Why the isolated plant should win. H: D. Jackson. Power 40:846-7 D 15 '14
Why the manufacturer prefers to use central station power, H. H. Holding. Elec W 65: 1231-2 My 15 '15

Power factor

ower factor
Action of phase advancer in regulating powerfactor of an induction motor, diag Elec W
66:191 Jl 24 '15
Investigation of dielectric losses with the
cathode ray tube, J: P. Minton, il Am Inst
E E Pro 34:1115-65 Je '15
Power-factor as element of rates, F. Ghilardi,
Elec W 66:410-11 Ag 21 '15
Synchronous motors for power-factor correction, T. Schou, Elec W 66:1138-42 N 20 '15

Power piping society
Standard power plant piping specification. Iron
Age 96:388 Ag 12 '15

Power plants

ower plants
Accident prevention in power plants. Power
42:281-2 Ag 24 '15
Analyzing the plant's condition. J. C. Hawkins.
Power 41:239-40 F 16 '15
Appearance as an element in power-plant
value. E. D. Dreyfus. Power 41:138-9 Ja 26

Comparative steam and electric

comparative steam and electric power layouts for a drainage pumping plant. plans Eng & Contr 42:412-14 O 28 '14 Concrete-unit building construction at Cedars Rapids. il diags Eng N 73:675-7 Ap 8 '15 Mechanical plant of the Equitable building, il plan Arch & Bldg 47:191-5 My '15 Panama-Pacific exposition; power plant apparatus. F. R. Low. il Power 42:225-9 Ag 17 '15

Power-plant equipment for Massachusetts institute of technology. Elec R & W Elec'n 67:854 N 6 '15; Same. Power 42:752-3 N 30

Power-station economics. E. J. Billings. Power 42:316-17 Ag 31 '15

Pre-efficiency. G: F. Willis. Power 41:500-1 Ap 13

Preventing losses in factory power plants. S. J. H. White Iron Age 95:777-9, 848-9 Ap 8-15'15

Recording power plant operations. J. C. Small-wood. il diags Eng M 49:818-36; 50:33-46, 262-75, 382-9 S-D '15

Waste in the management of public utility power plants, F. W. Collins. Eng M 49:888-93 S '15

See also Boiler plants; Electric Gas power plants; Hydroelectric Solar power plants; Steam plants plants;

Accounting

Keeping power plant accounts. C: J. Mason. Colliery 35:585-7 Je '15

# Pipina

See Piping

Power transmission Factory drives. G. Thompson. Metal Ind n s 13:9-10 Ja '15

Flow of energy. R. A. Philip. diags Am Inst E E Pro 34:455-84 Ap '15; Same. W Soc E J 20:444-72 My '15; Same cond. Fower 42:352-5 S 7 '15; Abstract. Elec W 65:1035-6 Ap 24 '15; Discussion. W Soc E J 20:472-7 My '15

New gasoline engine drive. Sci Am 112:288 Mr 27 '15

Return-pipe compressed-air practice. F. Richards. Power 41:224-5 F 16 '15

Steel-band power transmission; advantage over belt and rope shown in Germany. F. Broeker. Eng M 49:756-7 Ag '15 advantages

See also Belting; Chain gear; Compressed air; Electric transmission; Gearing; Hydraulic transmission; Machinery; Power plants; Pulleys; Rope driving; Shafting

Praseodymium

Revision of the atomic weight of praseodymium; the analysis of praseodymium chloride, C. P. Bayter and O. J. Stewart. Am Chem Soc J 37:516-36 Mr '15

Praseodymium chloride
Revision of the atomic weight of praseodymium: the analysis of praseodymium chloride. G. P. Baxter and O. J. Stewart. Am Chem Soc J 37:516-36 Mr '15

Precious stones
Identifying minerals and precious stones. Sci
Am S 80:46 Jl 17 '15

Testing

Tables for the determination of gems and precious or ornamental stones without injury to the specimen. A. J. Moses. Sch Mines Q 36:199-232 Ap '15

Precious stones, Artificial Imitation precious stones. Sci Am S 80:199 S 25 '15

Precious stones, Synthetic Technical utilization of precious stones. Sci Am S 80:163 S 11 '15

Premiums

Trading stamps and premium legislation. E. J. Buckley. Metal Work 83:753 My 21 '15

Preparation of copy. See Manuscripts, Prepara-

Preserving. See Canning and preserving

Press. See Newspapers

Press congress of the world Organization, Elec R & W Elec'n 67:308 S 4 '15

Pressboard

Investigation of dielectric losses with the cathode ray tube. J: P. Minton. il Am Inst E E Pro 34:1143-65 Je '15

Arbor and shaft straightening press. il Iron Age 96:195 Jl 22 '15
British Portland cement making machinery; briquetting presses, il diags Engineer 120: 148-51 Ag 13 '15
Cleveland shell banding and nosing press, il diags Mach 22:253-4 N '15
Dial feed attachment for large shells, il Iron Age 96:1222 N 25 '15
Hydraulic presses versus power presses for the manufacture of cartridges and shells; abstract. W: Rodger, Am Soc M E J 37:612-13 O '15

Pneumatic press for banding shrapnel, il Iron Age 95:1398 Je 24 '15

Age 95:1398 Je 24 '15 Sheet metal bending and forming press. il Iron Age 96:1229 N 25 '15 Stolp power presses. il Mach 21:1026 Ag '15 Toggle press with dwelling blankholder. il Iron Age 95:1167 My 27 '15; Iron Tr R 56:1114-15 '15

Two-stage combination drawing press. il diag Iron Age 95:504-5 Mr 4 '15 Wheel press for pressing pantograph shoes and testing springs and hose. R. R. Potter, il Elec Ry J 44:1257-8 D 5 '14

Zeh & Hahnemann percussion press. il Mach 21:1019 Ag '15

See also Hydraulic machinery

Presses, Printing. See Printing presses

Effect of pressure on the diver, il Sci Am 113:  $61+\ \mathrm{Jl}\ 17$  '15

Handy conversion table for low pressures. E. H. Peterson. Power 42:383 S 14 '15

See also Atmospheric pressure; Earth pressure; Wind pressure

Pressure gages
Differential gage for very small pressure differences. W: Easby, jr. il Eng N 72:1314 D 31

erman apparatus for measuring pressure and velocity of gases; abstract. E. Stach. diags Am Soc M E J 37:715-16 D '15

Home-made pressure indicator for heating system. R. A. Langworthy. diag Power 42: 725-6 N 23 '15

Inexpensive but accurate gage tester. F. W. Salmon, il Power 42:552 O 19 '15

New condenser gage: the Scanes vacuum efficiency and absolute pressure gage, diag Power 40:877-8 D 22 '14

See also Manometers

Presswork. See Printing, Practical-Presswork

Price cutting

Another phase of the law of price cutting; manufacturer can refuse to sell price-cutter but combination of retailers cannot compel action. E. J. Buckley. Metal Work 83:685 My

7 '15
Bid cutter and the annual statement. C: Hopmann. Metal Work 83:224 F 5 '15
Committee's report on price maintenance.
Horseless Age 35:199 F 10 '15
Cut price goods and restraint of trade. E. J.
Buckley. Metal Work 83:577 Ap 16 '15
Important decision on the Clayton act. Sci
Am 113:163-4 Ag 21 '15
Price cutting as viewed by the traveling salesman. J. K. Simpkins. Metal Work 83:433 Mr
19 '15
Price cutting is business philanthypoy. B. E.

19 '15
Price cutting is business philanthropy. P. F.
Brandstedt. Metal Work 83:359 Mr 5 '15
Price-fixing decision of Illinois court. E. J.
Buckley. Metal Work 84:475 O 8 '15
Three most important price-fixing cases now
before the public—the Ford, Victor and Kellogg cases. E. J. Buckley. Elec R & W Elec'n
67:201 Jl 31 '15; Same. Metal Work 83:887 Je
18 '15

Prices

Business methods for the plumber and fitter: standard selling prices. W. A. Fink. Dom Eng 72:171-2 Ag 7 '15 Standard prices for standard services. W. E. Clow. Metal Work 83:254 F 12 '15

See also Price cutting; Railroads-Rates; Wages

Primary batteries. See Electric batteries

Prime movers. See Engines

Princeton university

Design and construction features of the Palmer memorial stadium, Princeton, N. J. il diags plan Eng & Contr 43:472-5 My 26 '15 Palmer memorial stadium at Princeton university. il diags plan Eng N 72:1184-7 D 10 '14

Printers

Efforts of a novice to become a printer. J. T. Elliott. il Inland Ptr 54:769-74 Mr '15

Precautions for the health of printers. E: A. Boyle. Inland Ptr 55:787-8 S '15

Taking care of the apprentice. F. J. Don-nelly. Inland Ptr 55:197 My '15

Printing

History of composing-sticks, W: Sells. il Inland Ptr 54:839-40 Mr '15

Outgrowths of letterpress. G: Sherman. Inland Ptr 54:197-200, 343-6, 490-3, 625-30, 777-80; 55:42-7, 177-82, 321-7 N '14-Je '15

See also Advertisements; Blind—Printing and writing systems; Color printing; Compound words; Electrotyping; Embossing (typography); Lettering; Linotype; Paper; Photography; Plate printing; Posters; Printing machinery; Printing offices; Printing presses; Proofreading; Stereotyping; Textile printing; Typesetting; Typesetting machines

Bibliography

Literature of typography. H: L: Bullen. Inland Ptr 50:678-82, 836-41; 51:56-9, 214-6, 358-61, 518-20, 692-3, 857-8; 52:72-5, 233-5, 396-9, 555-7, 708-11, 873-5; 53:73-5, 236-9, 396-400, 555-8, 697-9, 860-4; 54:61-4, 219-22, 537-9, 676-8, 797-9; 55:60-2, 492-6, 635-8, 779-82; 56:60-4, 345-51 F '13-N '14, Ja-Ap, JI-D

Exhibitions

Printing, advertising and allied trades exposition, il Inland Ptr 55:547-50 Jl '15

**Ornaments** 

Conventional and illustrative decoration. J. L. Frazier. il Inland Ptr 54:801-4 Mr '15 Extent of decoration, J. L. Frazier, Inland Ptr 55:497-8 Jl '15

Proper use of initials, J. L. Frazier, Inland Ptr 55:499-502 Jl '15

Printing Continu d

Specimens

Announcements and invitations. Inland Ptr 55: 656a-656h Ag '15 Department of reset designs. Inland Ptr 56:

Reset specimens. Inland Ptr 55:352a-352h Je '15 Specimens. J. L. Frazier. See monthly numbers of Inland printer
Suggestions for cards and tickets. Inland Ptr 54:800a-800h Mr '15

See also Advertisements; Blotters; Business cards; Christmas printing; Labels; Menu cards; Programs

Study and teaching

Learning the printing trade in a newspaper office, W: H. Seed, il Inland Ptr 56:243-6 N

China

Commercial press, limited, Shanghai, China. W: H. Seed, il Inland Ptr 56:373-5 D '15

France

Literature of typography, H: L: Bullen, Inland Ptr 54:537-9, 676-8 Ja-F '15

Great Britain

Literature of typography, H: L: Bullen, il Inland Ptr 54:797-9: 55:60-2, 492-6; 56:60-4, 345-51 Mr-Ap. Jl, O, D'15

India

Printing in India. Inland Ptr 56:194-5 N '15

Printing, Practical

Creating a loss where profit is possible: prob-lem of layout. C. M. Butler. Inland Ptr 54: 638-9 F '15

lem of favout. C. M. Butter. Inland Ptr 54: 638-9 F '15

How to co-operate with the printer in the preparation of copy. J. T. Elliott. Inland Ptr 54:828-9 Mr '15

Printing and the care of printed stock. W. P. Baylie. il Am Gas Inst Pro 9:pt 2, 1708-38; Discussion. 1738-46 '14

Printing 1,000,000 transfers a day; the Third avenue railway system prints its own transfers at a net cost of 9 cents per 1000. il Elec Ry J 45:702-4 Ap 10 '15

Type-designs in imitation of engraved work. J. L. Frazier. Inland Ptr 55:353-4 Je '15

Use and misuse of panels. J. L. Frazier. Inland Ptr 54:373-8 D '14

Value of the preparation of copy. F. A. Kidd. Inland Ptr 55:622-3 Ag '15

Sre also Blotters; Ink; Labels; Printing trade; Programs; Proofreading; Typesetting

Accounting

Composing-machines and cost-accounting. C: J. Schott. Inland Ptr 56:54 O '15 Monotype accounting problems. C. D. Bol-linger. Inland Ptr 55:473-5 Jl '15

Costs

Cost and method. B. Daniels. See monthly numbers of Inland printer
Where to charge the wash-up. Inland Ptr 55: 523-4 Jl '15

Estimates

Estimating on blankwork, B. Daniels, Inland Ptr 55:803-5 S '15 Faculty of judgment, G. D. Crain, jr. Inland Ptr 56:333-5 D '15

How much profit? B. Daniels, Inland Ptr 55; 801-2 S '15
How to study an estimate. B. Daniels, Inland Ptr 55:657-8 Ag '15

Imposition, etc.

Handy rule-case for the make-up, il Inland Ptr 56:402 D '15

Presswork

More about make-ready. R. O. Vandercook. Inland Ptr 54:359 D '14
Old Bill on the make-ready problem. A. J. Clark. Inland Ptr 54:337-40 D '14
Position of forms on platen presses. F. L. Bush. Inland Ptr 55:766-7 S '15
Pressroom. See monthly numbers of Inland

printer

Science of make-ready. H. W. Hacker. Inland Ptr 55:185-8, 329-33 My-Je '15 Where to charge the wash-up. Inland Ptr 55: 523-4 Jl '15 '

Sce also Printing presses

Spacing

Correct spacing of body-matter, J. L. Frazier, Inland Ptr 55:355-8 Je '15
Distribution of white space. J. L. Frazier, Inland Ptr 56:355-8 D '15
Lesson in spacing, J. L. Frazier, Inland Ptr 56:353-4 D '15

Printing from plates. See Plate printing

Printing ink. See Ink Printing machinery

rinting machinery
Devices for automatically numbering checks, bonds, tickets, tags, etc., while being printed, Inland Ptr 54:844 Mr '15
Disposal of secondhand printing-office machinery. H. De Lisle. Inland Ptr 54:487-9 Ja '15
Electricity in magazine publishing. il Elec R & W Elec'n 66:105-7 Ja 16 '15
Electricity in printing plants. il Elec R & W Elec'n 66:851-5 My 8 '15
Electricity in the publishing business il Electricity.

Electricity in the publishing business. il Elec R & W Elec'n 66:851-5 My 8 '15 Electricity in the publishing business. il Elec R & W Elec'n 65:1069-72 D 5 '14 Use of electricity in a newspaper plant; motor and control equipment for production of New York times. il Elec W 65:1627-31 Je 19 '15

Monotype: presses; Typesetting machines

Printing offices

Chew printing house, Camden, N. J. il plans Erickb 24:11-12 Ja '15
Commercial press, limited, Shanghai, China. W: H. Seed, il Inland Ptr 56:373-5 D '15
Modern printing-house construction. W. Essex. il Inland Ptr 54:554-8 Ja '15
Motor-driven plant of the Dallas News. A. C. Scott, il plan Elec W 65:462-5 F 20 '15
Use of electricity in a newspaper plant; motor and control equipment for production of New York times. il Elec W 65:1627-31 Je 19 '15
Western newspaper union plant in Chicago. T: Wilson. il plan Power 41:2-5 Ja 5 '15

See also Cambridge university Chapple publishing company

Equipment

Financial view of overequipment. B. Daniels. Inland Ptr 55:100 Ap '15 What is overequipment? Inland Ptr 55:522 Jl

Management

Management
After the cost system—specialization of equipment and product. J. E. Thompson. Inland Ptr 54:634-6 F '15
Efficiency in the small shop. H. Hillman. Inland Ptr 55:609-14 Ag '15
How much composing-room? B. Daniels. Inland Ptr 54:835-6 Mr '15
Inventory for printers. Inland Ptr 54:692-3 F '15

"15
Methods of conserving cost in printing-offices. W: Sells. Inland Ptr 54:397-9 D '14
Office clerk problems—adjusting complaints. C: Fried. Inland Ptr 55:188-9 My '15
Office clerk problems—collections. C: Fried. Inland Ptr 56:186-8 N '15
Office clerk problems—relations with the salesman. C: Fried. Inland Ptr 56:188-90 N '15
Organizing a sales campaign. F. Ford. Inland Ptr 56:188-90 N '15
Printer and his business. L: H. Grieve. Inland

Printer and his business, L: H. Grieve, Inland Ptr 54:652-4, 817-18; 55:63-4 F-Ap '15 Stake in the business, G. D. Crain, jr. Inland Ptr 55:239-40 My '15

See also Printing trade

Moving

Western newspaper union solves problem of moving its large plant without interrupting business, J. T. Elliott. il Inland Ptr 54:406-8 D '14

Valuation

Values of printing offices. C: S. Brown. Inland Ptr 56:43-5 O '15

Printing presses Application of electric motors to printing presses. W: C. Yates. Am Inst E E Pro 34: 3018-23 D '15

Printing presses—Continued

Electric motor in the printing industry, W. C. Yates, il Gen Elec R 18:1136-12 D 15

Electrically driven vacuum sheet-cleaner for cylinder presses, il Elec R & W Elec'n 66: 175 Ja 23 '15

Getting best service from printers' rollers, R. E. Haynes, Inland Ptr 55:676-7 Ag '15

New type of rapid rotary printing-press, Inland Ptr 55:535 Jl '15

Seventy years of inventions, Sci Am 112:516-17 Je 5 '15

What causes the packing on a cylinder press

What causes the packing on a cylinder press to creep or bunch forward? W. S. Huson. Inland Ptr 55:350 Je '15

Sec also Printing, Practical-Presswork Printing telegraph, See Telegraph, Printing

Printing trade

Do your own printing business. E. Wolcott. Inland Ptr 56:199-200 N '15 How to sell a catalogue, R. C. Fay. Inland Ptr 55:104-6 Ap '15 Long price-list. Inland Ptr 54:501-2 Ja '15 New field for the printer; advertising on paper wrappers. T: H. Stark. Inland Ptr 56:

45-7 () '15 Peculiarities of the printing business. Inland Ptr 55:662 Ag '15 Personal element in the printing business. W: E. Rudge, Inland Ptr 56:247 N '15 Please wake up. W. R. Colton, Inland Ptr 54: 833-4 Mr '15 Remedy for overequipment—better selling. F. Webster, Inland Ptr 54:387-8 D '14 Small shop, C. H. Armstrong, Inland Ptr 54: 781-2 Mr '15

F. Webster, Manuel Small shop, C. H. Armstrong, Inland Ptr 54: 781-3 Mr '15
Special prices on paper to printers, B. Hope, Inland Ptr 54:341-3 D '14

Advertising

Advertising for printers. J. L. Frazier. Inland Ptr 54:513-16 Ja '15 Making printing a sales force. I. S. Paull. In-land Ptr 55:688-70 Ag '15 Printers' blotters. Inland Ptr 55:784a-784h S '15

Printometer

Demand indicators: maxicator and printometer types. il Munic J 38:906 Je 24 '15

Prismatic compass. See Compass, Prismatic

Prison labor. See Convict labor

Prisons

Many jails in this country declared insanitary. il Dom Eng 73:16-17 O 2 '15 Prisons, Military. See Concentration camps

Private car lines

Private car lines not common carriers, Ry Age 58:1051-2 My 21 '15

Prizes. See Rewards, prizes, etc.

Proctor (John C.) recreation center. See Peoria, Illinois—John C. Proctor recreation center Producer gas. See Gas

Productograph

Watching distant machines from a desk. H. T. Wade. il Sci Am 112:161-2 F 13 '15

Professional education
Education for professional success. S. H. Bunnell. Eng Rec 71:688-9 My 29 '15
Training for the numicipal service. C. L. King. Sci Am S 79:118-19 F 20 '15; Same cond. with discussion. Am Soc M E J 37:98-101 F '15

Professional ethics
Circular of advice relative to principles of the professional practice and the canons of ethics of architects. Am Inst Arch J 3:103
Mr '15

See also Engineering ethics

Profiling Mechanical production of drop forging dies. E: K. Hammond. il Mach 22:1-5 S '15

Profile milling and grinding. E. Lea, il diags Mach 21:821 Je '15

Wilzin process for flat-ware manufacture. il Mach 22:76-7, 80 S '15

Wilzin process of flatware manufacture, il Metal Ind n s 13:374-7 S '15

Profit sharing Industrial betterment. F. E. Cardullo. Mach 22:183-4 N '15

Is a profit sharer always a partner? E. J. Buckley. Metal Work 82:803 D 18 '14 Making of men, motor cars and profits of the Ford motor company. O. J. Abell. il Iron Age

Ford motor company. O. J. Abell. il Iron Age 95:33-41+ Ja 7 '15
Making the workmen happy. H. Whitehead. Dom Eng 72:33-4 Jl 10 '15
Model industrial village in Illinois town. I. M. Tarbell. Metal Work 83:409 Mr 19 '15
Profit sharing plan explained to the Federal commission on industrial relations. H: Ford. Iron Tr R 56:231-5 Ja 28 '15
Washington railway & electric company's profit-sharing checks. C. P. King, Elec Ry J 45:157-8 Ja 16 '15

Programs

Specimens, Inland Ptr 55:496a-496h Jl '15

Prohibition

Alcohol and inefficiency. Eng & Min J 99:461 Mr 6 '15

Projectiles

rojectiles
Aeroplane darts and fire darts, il Sci Am S
79:124 F 20 '15
Field gun and aerial projectiles; construction
of shrapnel, smoke, and searchlight shells
and bombs for the use of aircraft, il Sci Am
111:452-3+ D 5 '14
How rifle bullets fly. E; C. Crossman, il Sci
Am 113:24+ Jl 3 '15
Navel projectiles supply, il Japa, Agg, 96:1186-7

Naval projectile supply, il Iron Age 96:1186-7 N 18'15

N 18 '15 Riffing cannon, F. J. B. Cordeiro, Sci Am S 79:334 My 22 '15 Riffing of firearms, A. Keller, diags Sci Am S 79:277-8 My 1 '15 Steel darts, Sci Am 112:156 F 13 '15 Windage of shot, Sci Am 112:308 Ap 3 '15

See also Ammunition; Bullets; Grenades; Shells; Shrapnel shells

Manufacture

Grinding large shells and projectiles. C. O. Smith, il diags Iron Age 95:445-7 F 25 '15 Hydraulic presses versus power presses for the manufacture of cartridges and shells; abstract. W: Rodger. Am Soc M E J 37:612-13 O '15

Machinery for the production of projectiles. il diags Engineer 119:572-6, 599-602, 634-6; 120:3, 116-17, 278, 338-9 Je 11-J1 2, 30, S 17,

O 8 '15 Machines for making projectiles, il Iron Tr R 56:383-4+ F 18 '15 Machining high-explosive shells, C. A. Tupper, ding Iron Age 96:806-9 O 7 '15 Machining projectile shells, il diags Iron Age 96:1099-1100 N 4 '15 Single-purpose chucking turret lathe brought out by the Cleveland crane & engineering company, Wickliffe, Ohio, il Iron Age 96:872 O 14 '15

Three projectile machines, il Iron Age 95:402-

Projectiles, Photography of. See Photography of projectiles

Projection of light. See Light projection

Projectors. See Light projection Promotion. See Employees

Pronunciation. See Phonetics

Proofreading

Copy and proofreading. F. H. Teall. Inland Ptr 54:631-4 F '15

Correction of grammar by proofreaders. F. H. Teall, Inland Ptr 54:775-7 Mr '15

Printing and the care of printed stock. W. P. Baylie. Am Gas Inst Pro 9:pt 2, 1726-7 '14 Proofreading and authorities, F. H. Teall. Inland Ptr 55:333-5 Je '15

Proofroom. F. H. Teall. See monthly numbers of Inland printer

Varying styles and proofreading. F. H. Teall. Inland Ptr 55:468-70, 614-16, 756-9; 56:58-9, 202-3, 326-8 Jl-D '15

See also Compound words, Time tuation; Spelling

Propane

Vapor pressures of propane, propylene and normal butane at low temperatures. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:2188-93 S '15

Propellers

ropellers
Comparison between the results of propeller experiments in air and water. A. W. Johns. Engineer 119:335-6 Ap 2 '15
Design of small screw propellers. D. H. Jackson, diags Int Marine Eng 20:446-50 O '15
Dyson chart system of propeller design. J. S. Maiseed, diag Int Marine Eng 20:74-5 F '15
Negative slip of propellers. Engineer 120:265

S 17 '15
Propeller blade layout, H. M. Adams, diags
Int Marine Eng 20:85-7 F '15
Recent tests on flow of water acted on by a
propeller; abstract, Flamm, Am Soc M E J
37:559 S '15
Parisal of the reversible blade propeller, il

37:559 S 15 Revival of the reversible blade propeller, il diags Engineer 119:295-7, 306 Mr 26 '15 Theory of propulsion and the screw propeller, F. W. Lanchester, Engineer 119:335 Ap 2

Weights of solid four-blade propellers. L. A. Baier, Int Marine Eng 20:220 My '15

Property

Reclaiming property after a transfer. E. J. Buckley. Metal Work 82:772 D 11 '14

See also Real estate; Sales

Propylene

apor pressures of propane, propylene and normal butane at low temperatures. G. A. Eurrell and I. W. Robertson. Am Chem Soc J 37:2188-93'S '15

Prospecting

Prospecting
Exploration work on Cuyuna range. P. W.
Donovan. Iron Tr R 57:534+ S 16 '15
Prospecting for minerals in Ontario. J. A.
Macdonald. Eng & Min J 99:1067-8 Je 19 '15
Prospecting methods at Fairbanks. H. I. Ellis.
il diags Eng & Min J 99:805-10 My 8 '15
Requirements for prospecting dredging ground in the Yukon. J. A. Macdonald. Eng & Min J 99:828-9 My 8 '15
Sampling of churn-drill prospect holes. F: G.
Moses. diags Eng & Min J 100:301-4 Ag 21 '15
Wisconsin zinc district. H. C. George. il diags map Eng & Min J 100:295-300, 341-4 Ag 21-28 '15

See also Assaying

roteins

Combination of protein with halogen acids,
J. H. Long and M. Hull. Am Chem Soc
J 37:1593-1606 Je '15

Nitrogen-protein table. R. S. Callaway. J Ind
& Eng Chem 7:161 F '15

Origin of the humin formed by the acid
hydrolysis of proteins. R. A. Gortner and
M. J. Blish. Am Chem Soc J 37:1630-6 Je '15

Presence of proteoses and peptones in soils.
E. H. Walters. J Ind & Eng Chem 7:860-3 O
'15

Protein charts. A. Silverman. J Ind & Eng Chem 7:533-4 Je '15

Studies on nitrated proteins: the conversion of fibroin into nitro-fibroin (fibroin-xantho-proteic acid). T. B. Johnson, A. J. Hill, and L. P. O'Hara. Am Chem Soc J 37:2170-8 S '15

Studies on nitrated proteins: the determination of the structure of nitrotyrosine. T. B. Johnson and E: F. Kohmann. Am Chem Soc J 37:1863-84 Ag '15

Studies on nitrated proteins; the identifications of 3-nitrotyrosine among the products of hydrolysis of nitrated fibroin. T. B. Johnson. Am Chem Soc J 37:2598-603 N '15
Studies on nitrated proteins; the syntheses of 3, 5-dinitrotyrosine. T. B. Johnson and E: F. Kohmann. Am Chem Soc J 37:2164-70 S '15

Utilization of ingested protein as influenced by undermastication and overmastication. L. F. Foster and P. B. Hawk. Am Chem Soc J 37:1347-61 My '15

Proteolysis

Acid ratio: a new method for determining the proteolytic strength of germinated grain in technical analysis. C. A. Nowak. J Ind & Eng Chem 7:858-9 O '15

## Providence, Rhode Island

Public buildings

Civic architecture in Providence. Am Inst Arch J 3:386-7 S '15

Public works

Harbor development for Providence, R. I. plan Eng & Contr 43:sup21 Je 30 '15

Water supply

Water-supply improvements for Providence. Eng N 74:669 S 30 '15

Pruning

Timely suggestions for the pruner of orna-mental and shade trees. J. J. Levison. il Am For 21:931-2 S '15

Prussian blue. See Cyanogen

Przemysl

Recapture of Przemysl. il Sci Am 113:251 S 18

Psychoanalysis

Psychanalytic movement: its services in the prevention of insanity. J. J. Putnam. Sci Am S 78:391, 402 D 19-26 '14

Psychology

Modern psychology; the present study of char-acter and temperament. J. Jastrow. Sci Am S 80:306-7 N 13 '15

See also Animal intelligence; Color sense

Psychology, Experimental Study of animal and human behavior. L. K. Hirshberg. il Sci Am 112:491-2 My 29 '15

Psychology, Pathological
Mental tests of dementia. B. Hart and C. Spearman. Sci Am S 80:206-8 S 25 '15
Psychanalytic movement: its services in the prevention of insanity. J. J. Putnam. Sci Am S 78:391, 402 D 19-26 '14

Psychrometers

Measurements for the household, il U S Bur Stand Circ 55:114-17 '15

Public accountants. See Accountants, Public

Public buildings

Operating data in connection with federal buildings under control of the Treasury department. N. S. Thompson, Heat & Ven 12: 13-17 JI; 17-20 Ag '15

Sce also Almshouses; Baths, Public; Capitol buildings; Library architecture; Municipal buildings; Post office buildings; Prisons; Public works; Schoolhouses

Public comfort stations

ublic comfort stations

Bandstand and comfort station. il plan Bldg

Age 37:67-8 N '15

Comfort station for Springfield, Massachusetts. il plan Metal Work 83:228+ F 5 '15

New Boston comfort station. W. B. Conant. il

Munic J 39:473 S 23 '15

New public comfort station in Cincinnati. il

plan Metal Work 83:430-2 Mr 19 '15

Planning public comfort stations Metal Work

Planning public comfort stations. Metal Work 83:542 Ap 9 '15 Plumbing in Oakwood park comfort station, Lorain, O. il plan Metal Work 84:235-6 Ag

Plumbing in small park comfort station, il plan Metal Work 83:155-6+ Ja 22 '15
Public-comfort station built in Salt Lake City, Utah, S. Q. Cannon, il Eng N 73:937
My 13 '15

This confort station Dellos Tory I. Bell H

Public comfort station, Dallas, Tex. J. Boll. il Dom Eng 70:41 Ja 9 '15

Public comfort station in Dallas, Texas. Metal Work 83:249-50 F 12 '15

Public comfort station now under construction in Springfield, Mass., at a cost of twenty-four thousand dollars. H. L. Sprague, il plan Munic J 38:218-19 F 18 '15

Sanitary equipment of Monrovia, California, il plan Metal Work 84:362+ S 17 '15

Public health

American public health association, 43d annual meeting. Munic J 39:483-4+ S 23 '15 Plumbing and its relation to public health. W: C. Groeniger. Metal Work 83:415-16+

W: C. G Mr 19 '15

See also Building laws; Disinfection See also Building laws; Disinfection and disinfectants; Dust prevention; Factory sanitation; Hookworm disease; Housing problem; Military hygiene; Physical examinations; Plumbing laws and regulations; Public comfort stations; Railroads—Sanitation; Refuse and refuse disposal; Safety devices and Public health -- Continued

measures; Sanitation; School hygiene; Sewage disposal; Street cleaning; Water pollution; Water supply; also names of cities, subheads Sanitary affairs and Sewerage

Public health boards. See Health boards

Public health laws

ubuc neath laws

New York city sanitary code. Metal Work 83:
348 Mr 5 '15

Removal of dead animals in cities. A. L. Bostwick. Munic J 38:64-5 Ja 21 '15

State control of water-supply and sewerage in Kansas. Eng N 73:209 F 4 '15

See also Building laws; Factory laws; Heating—Laws and regulations; Plumbing laws and regulations; Sewerage—Laws; Ventilation—Laws

Public lands

United States mining statutes annotated; reservations, rights of way, withdrawals. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 1159-66, 1188-93, 1388-94 '15

Public offices

See also Public service

Public schools
Master mechanics to teach in public schools.
W: Wirt. Metal Work 83:841 Je 11 '15

Public service

Business men and public service. Ry R 55:688-90, 716-18, 775-7; 56:93-5, 127-9, 193-4, 207-8 D 5-12, 26 11, Ja 16-22, F 6 12 15 Government's business, It needs regulation by business men. Ry R 55:746-8 D 19 '14

See also Municipal employees

Public service commissions
Capable men as public commissioners. Eng &
Contr 43:2 Ja 6 '15

Commission regulation. Elec Ry J 45:810 Ap

24 '15
Continuity of policy and experienced personnel necessary for service boards. Eng Rec 72: 170 1 Ag 7 15
Engineers and public-service commissions. Engineers as members of public service commissions. C: H. Ledlie. Eng N 73:547-8 Mr

18 '15

Illinois utilities commission and the water works companies. C. G. Bennett. Am Water Works Assn J 2:382-9 Je '15

New York commission lacks power to increase rates beyond legislative maximum. Elec Ry J 46:126 Jl 17 '15

New York commissions. Elec W 65:375 F 6 '15

New York, New Jersey and New Hampshire state commission reports. Ry Age 58:138-9

Ja 22 '15

Publicity work of public service commissions.

Ja 22 '15
Publicity work of public service commissions. Elec Ry J 44:1240-3 D 5 '14
Qualifications of public service commissioners. Ry Age 59:244-5 Ag 6 '15
State commissions with jurisdiction over electrical utilities; map. Elec W 65:1597 Je 19 '15
State regulation of municipally owned plants. C. M. Larson. Am Water Works Assn J 2:515-37 S '15
To get the best men for commissioners. G: W. Anderson. Ry Age 57:1198 D 25 '14
Work of the cummissions. Elec Ry J 45:5-6 Ja 2 '15

Work of the Illinois utilities commission; with discussion. R. M. Feustel. W Soc E J 19:965-

See also New York public service commission; Public service corporations—Regulation

Public service corporations
Constructive policy for public service corporations. C: Day. Eng M 48:599-603 Ja '15

International engineering congress; report of electrical and related sessions. San Francisco, Sept. 20-25. Elec R & W Elec'n 67: 617-18 O 2 '15

M. I. Cooke finds fault with utilities. Elec W 65:755-6 Mr 20 '15

Oklahoma gas, electric & street railway ciation 4th annual convention. Elec V 1340 My 22 '15

Public service. T. N. Vail. Elec R & W Elec'n 66:534-5 Mr 20 '15

Waste in the management of public utility power plants. F. W. Collins. Eng M 49:888-93 S '15

See also Electric service companies; Express companies; Franchises; Gas companies; Government ownership; Municipal ownership; Public service commissions; Railroads; Street railroads; Telegraph; Telephone companies; Water companies

## Accounting

Accounting
Ancient and modern accounting for public utilities. E. A. Pratt. Am Water Works Assn J 2:371-81 Je '15
Neglected phases of accounting. H: R. Hatfield. Elec Ry J 46:799-802 O 16 '15
Rents in public utility accounting. J: Bauer. J Account 20:21-7 Jl '15
Work of public service accountants. H. S. Swift. Elec Ry J 44:1298 D 12 '14
See also Electric service companies—Accounting; Gas companies—Accounting; Waterworks—Accounting

## Advertising

Co-operative power customers' display at Hartford. il Elec W 65:303 Ja 30 '15

#### Finance

Finance
Factors involved in establishing service, charge and rate of return of public utilities. O. E. Norman. Am Gas Light J 102: 263, 267-9 Ap 26 '15
Financing problems of public utilities companies. W: H. Hodge. Am Gas Light J 102: 215, 218-19 Ap 5 '15
Financing public utility properties. A. Cooke. Am Gas Light J 103:154-6 S 6 '15
Investment banker and the engineer. C. A. Hobein. Assn Eng Soc J 54:243-57 Je '15

#### Franchises

Modern franchise for a public service corporation. C: C. Brown. Munic Eng 48:89-93 F

Public service corporation and the municipality; with discussion, J. Logan, Boston Soc C E J 2:223-59 Je '15

## Law

Maine public utilities act. Elec W 65:58 Ja

Rights of railroad stockholders; minority report. Ry R 56:667-8 My 15 '15

## Public relations

Address at mid-year dinner, C. L. Allen, Electry J. 45(280) F. 6 [15] Influence of good-neighborliness; the public utility as a human institution, il Elec W 65: 941-3 Ap 10 [15]

941-3 Ap 10 '15
Large questions of public policy before the electrical industry. W. W. Freeman. Elec W 65:16-17 Ja 2 '15
Mixing as an asset of public utility business. H. S. Cooper. Elec Ry J 45:842-3 My 1 '15
Pointed paragraphs on public policy. Elec W 64:1254 D 26 '14
Public service and publicity. N. C. Kingsbury. Elec Ry J 45:223-6; Discussion. W. C. Ely; E. G. Connette. 45:216-17 Ja 30 '15

See also Electric Railroads—Public relations; Electric service companies—Public relations

#### Rates

Basing rates upon cost of service. Elec R & W Elec'n 66:61-2 Ja 9 '15
Fair interest on investment in public utilities.
H. J. Davies. J Account 19:34-45 Ja '15;
Same cond. Elec Ry J 44:1287-9 D 12 '14

Public versus the public service corporation. H: D. Jackson. Eng M 49:402-9 Je '15

Rates different not necessarily discriminatory. Am Gas Light J 103:335 N 22 '15

State regulation of municipally owned plants, C. M. Larson, Am Water Works Assn J 2:522-37 S '15

Value of service and cost of service in rate-making, C. M. Jansky, Elec R & W Elec'n 66:80-1 Ja 9 '15

See also Electric power—Rates; rates; Telephone—Rates; Water rates

## Public service corporations—Continued

#### Regulation

Address before the Indiana gas association. A. C. Blinn, Am Gas Light J 102:177-8 Mr 22 '15

Application of the theories of public regula-tion to the management of utilities, D. A. Graham, Am Water Works Assn J 2:324-43

Charges, connections and extensions; order of

Charges, connections and extensions; order of California railroad commission. Am Gas Light J 103:188-9 S 20 '15
Competition in small-city utility operation. B. A. Brackenbury. Elec W 66:1-5 Jl 3 '15
Conditions that will encourage hydroelectric development. J: A. Britton. Elec W 64:1236-

Dual ownership of public utilities in Alsace. M. A. Jewett. Munic Eng 49:65-6 Ag '15 Effect of the war on regulation of public utilities. N. T. Guernsey. Elec W 65:12-14 Ja 2

'15
Fair treatment of public utilities. A. B. Leach.
Elec Ry J 46:670-1 O 2 '15
Fundamental planks in a public-utility program. D. F. Wilcox. Eng N 72:1215 D 17 '14
Idaho power and light company granted a certificate of convenience and necessity. Elec R & W Elec'n 66:249-50 F 6 '15
Municipal co-operation in public utility management. P. J. Kealy. Am Inst E E Pro 34:
2263-74 O '15; Same cond. Elec Ry J 46:861-3

O 23 '15
Municipal regulation of public utilities. J: H.
Roemer. Am Gas Light J 103:97-100 Ag 16 '15
National Bureau of standards and standards
for public utilities. H. T. Wade. Eng M 49:
240-51 My '15
Naw York second district: filing of schedules. New York second district; filing of schedules.

New York second district: filing of schedules.

Liber 1; & W. Electric 19:256 F. 13. L.

Permitting and limiting public-utility computition. Eng. N. 73:656 Ap. 8-15.

Public utilities work of the Bureau of standards. Elec W 64:1187-8 D 19 '14

Public versus the public service corporation.

H: D. Jackson. Eng. M. 49:402-9 Je '15

Regulation. W. J. Calhoun. Am Gas Light J. 102:294-5+ My 10 '15

Regulation of public utilities. L. A. Busby.

Elec Rv. J. 46:1081-4 N. 27 '15; Abstract. Elec R. & W. Elec'n 67:986 N. 27 '15

Results of the war for public service commis-

Results of the war for public service commissions to consider. H: Floy. Elec W 65:15-16 Ja 2 '15

Right of appeal in New Hampshire. Elec W  $_{65:1485\text{-}6}$  Je  $_5$  '15

Shall American industry be socialized? F. C. Henderschott. Am Ind 15:29-32 Jl '15

State control of city-owned utilities much needed. Eng N 74:658-9 S 30 '15
State regulation. W: J. Norton. Elec R & W Elec'n 66:632-3 Ap 3 '15

State regulation of municipally owned plants. C. M. Larson. Am Water Works Assn J 2: 515-37 S '15

Nee also Electric service companies—Regulation; Gas companies—Regulation; Railroads and state; Waterworks—Regulation

## Taxation

Increased taxation in Wisconsin and its effect upon public service companies. E. Gruhl. Elec W 65:259 Ja 23 '15; Same. Elec Ry J 45:234 Ja 30 '15

Should utilities be assessed by public service commissions? F. N. Ebtcher, Elec Ry J commissions? 46:445 S 11 '15

Tax assessments on utility properties subject to review in New Jersey. Elec R & W Elec'n 66:128 Ja 16 '15

## Valuation of property

Appellate court of the state of New York and the question of allowances for paving over mains in valuation work. J: W. Alvord. Am Water Works Assn J 2:465-81 S '15; Same cond. Eng & Contr 43:532-5 Je 16 '15; Discussion. Am Water Works Assn J 2:482-92

Appraisal of overhead costs. H. P. Gillette. Elec W 66:41-2 Jl 3 '15

Court decisions showing present value to be the only value for rate making purposes. H. P. Gillette, Eng & Contr 43:302 Mr 31

Depreciation and valuation for rate making. L: H. Haney. J Account 19:344-51 My '15 Depreciation in public utilities. Elec W 66:743

Engineers as arbiters of public equity and justice. W. M. Daniels. Eng Rec 70:623-4 D 5

'14
Fair interest on investment in public utilities.
H. J. Davies. J Account 19:34-45 Ja '15;
Same cond. Elec Ry J 44:1287-9 D 12 '14
Fair overhead charges allowed; Bronx gas and electric company. Elec Ry J 46:831 O 16 '15
Foundation principles of utility valuation, with special application to resettlement plans.
B. J. Arnold. Eng N 74:859 O 28 '15
Franchise value. Elec R & W Elec'n 65:1180-2
D 19 '14
Fundamentals of appraisal and valuation

Franchise value. Elec R & W Elec'h 55:1180-2
D 19 '14
Fundamentals of appraisal and valuation.
M. E. Cooley. Elec Ry J 46:913 O 30 '15
Idaho court overrules depreciation deduction. Eng Rec 72:480-1 O 16 '15
In rate-fixing by commission, should depreciation be deducted from plant valuation? A. C. Humphreys. Am Gas Inst Pro 9:pt 2, 1557-82; Discussion. 9:pt 2, 1638-82 '14
Neglected phases of accounting. H: R. Hatfield. Elec Ry J 46:799-802 O 16 '15
New Jersey decision. H. S. Welsh. Elec Ry J 45:57 Ja 2 '15
Pacific gas & electric company valuation methods. Elec W 65:569-70 F 27 '15
Papers on public utility valuation; abstracts.
J: W. Alvord; J. H. Gandolfo. Elec Ry J 44:1252 D 5 '14
Portland valuation brief filed. Elec Ry J 46:

Portland valuation brief filed. Elec Ry J 46: 922 O 30 '15

Portiand valuation brief filed. Elec Ry J 46: 922 O 30 '15
Principles of valuation. J: W. Alvord. Eng Rec 70:677 D 19 '14
Sandpoint, Idaho, water company case. Elec R & W Elec'n 67:897-8 N 13 '15
Sinking funds in rate valuations. W. H. Lawton. J Account 19:191-7 Mr '15
Utilities bureau convention, Philadelphia, 1915; valuation conformer Fire N 74:1009 '9

ton. J Account 19:191-7 Mr '15
Utilities bureau convention, Philadelphia,
1915; valuation conference. Eng N 74:1002-3
N 18 '15: Elec Ry J 46:990-5, 1031-4 N 1320 '15; Elec R & W Elec'n 67:939-41 N 20
'15; Elec W 66:1125-9 N 20 '15; Eng Rec 72:
643-5 N 20 '15; Munic J 39:788-9 N 18 '15
Utility appraisals. G: B. Saunders. Elec Ry J
45:981-5 My 22 '15
Valuation of Cincinnati utility. Elec W 64:1088

Valuation of franchises. Elec Ry J 44:1331-3

Valuation of public utilities discussion by Am. Inst. E. E. Elec R & W Elec'n 67:568-9 S Valuation of public utilities for rate-making purposes, C: C. James, J. Account 20:122 2

Why appraisal is not valuation. G: S. Binckley. Eng Rec 72:515-17 O 23 '15

Nec also Electric railroads—Valuation; Railroads—Valuation; Street railroads—Valuation; Waterworks—Valuation

Public speaking, F. L. Hutchinson, Eng Rec 72:672 N 27 '15

Public utilities. See Public service corporations

Public utility association of West Virginia West Virginia managers convene. Elec W 1182-3 N 27 '15

## Public works

Alternate specifications for public work are legal. D. T. Pierce. Eng N 74:1048-50 N 25

Commission plan for control of public works, Eng N 73:1186-8 Je 17 '15
Direct control over construction materials is feature of 100-mile Winnipeg aqueduct, il Eng Rec 71:594-6 My 8 '15
Engineers and the New York state constitutional convention. Eng N 73:602-3 Mr 25 '15
Engineers discuss changes in New York state constitution. Eng Rec 71:382 Mr 20 '15
How shall patented materials or processes on public works be handled? D. B. Luten; S. Whinery. Eng Rec 72:546-9 O 30 '15
How shall patented materials or processes on public works be handled? G: C. Warren; S. Whinery. Eng Rec 72:511-12 O 23 '15

Public works -Continued

ublic works—Continued
Results of task work without bonus in cleaning filter sand at Philadelphia, S. E. Thompson, Eng Rec 70:608-9 D 5 '14; Same cond. with discussion, Am Soc M E J 37:102-1 F '15; Same cond. (Efficiency study of filter cleaning), Munic J 38:253-1 F 25-15

Sce also Contracts, Letting of; Municipal engineering; Public buildings; Roads

Publicity

ublicity
American iron and steel institute presidential
address. E. H. Gary. Iron Tr R. 57:849-51 O
28 '15; Same. Iron Age 96:985-8 O 28 '15
Engineer and publicity, with special reference to the publicity work of the Cleveland
engineering society; abstract. C. E. Drayer.
Eng & Contr 42:374-5 D 23 '14; Abstract,
with discussion. Am Soc M E J 37:88-92 F

Future of the engineering profession. A. J. Himes. Eng Rec 72:663 N 27 '15 Interesting the non-electrical public. F. H. Gale. il Elec W 66:1184-6 N 27 '15 Practical value of publicity to the water works man. S. C. Hadden. Am Water Works Assn J 2:359-66; Discussion. D. R. Gwinn. 2:366-70 Je '15

70 Je '15'
Publicity for engineering work. M. L. Cooke;
C. E. Drayer; S. H. Ankeney. Eng Rec 70:
644-8 D 12 '14
Publicity for the engineer and its importance;
excerpts. C. E. Drayer. Eng N 73:1018-19
My 27 '15; Eng Rec 71:718-19 Je 5 '15'
Publicity necessary for city manager success.
W. Miller. Eng Rec 72:666 N 27 '15'
Publicity work of public service commissions.
Elec Ry J 44:12:40-3 D 5 '14

See also Advertising; Electric railroads—Public relations; Public service corporations—Public relations; Railroads—Public relations; Street railroads—Public relations

Publishing houses

Equipment of large publishing house; power plant, interior wiring and special features of the Curtis publishing company's building, Independence square, Philadelphia, il diags plans Elac W Chy Ch-11 Ap 10 Th Hill building, New York, il Arch & Bldg 46: 447-50 N '14
Hill building; special building design for special use, il diags plans Eng N 72:1241-8 D 24 '14
New home of the Lagrange New home of the Lagrange Property o

New home of the Engineering and min journal. il Eng & Min J 98:1143-4 D 26 '14 Philadelphia publishing house; Farm journal building, il plan Brickb 24:201 Ag '15

See also Printing offices

Pulleys

Cork insert pulley. il Eng M 49:sup1-2 S '15 Cutter automatic cutout pulleys. il Elec R & W Elec'n 66:1129 Je 12 '15

Designing cone pulleys: graphical method of finding the radii, R. C. H. Heck. Mach 21: 291-3 D '14

Grinding cone pulleys at the Norton plant. H. W. Ault. il diags Mach 22:32 S '15

Grinding crowned pulleys, H. W. Dunbar, il diags Mach 21:893-4 Jl '15

Making the Gilbert wood pulley, il Mach 21: 483-6 F '15

Recent tests of the effective force between driving belt and pulleys; abstract. A. Fried-rich. Am Soc M E J 37:554-5 S '15

See also Belting; Rope driving

Pullman company Investigation of wages paid by Pullman com-pany. Ry Age 58:786 Ap 9 '15

Pumping

See also Mine pumping; Pumping stations; Pumps

· Cost

Comparing triple-expansion and centrifugal pumps. G; M. Peek; G: H. Gibson. Eng N 74:1044-5 N 25 '15

Comparison of pumping costs. C. F. Herington. Ry Age 59:108-9 Jl 16 '15

ost of drainage pumping in southern Louisiana. C. W. Okey. Eng N 74:733-5 O 14 '1

Cost of electric pumping for irrigation, il map Elec W 66:68-71 Jl 10 '15; Excerpts. Eng Rec 72:257-8 Ag 28 '15

Rec 72:257-8 Ag 28 '15 Cost of pumping for irrigation. G. E. P. Smith. Eng & Contr 44:148-50 Ag 25 '15 Electric pumping at Fairmount, Ind.; com-parison of service by reciprocating steam pumps and by electrically driven centrifugal pumps. J: A. Randolph. Munic J 39:356-8 S

& W Elec'n 66:1022-8 Je 5 '15
First cost and cost of operation of irrigation pumping plants. H. D. Hanford. Eng & Contr 43:491-2 Je 2 '15
How low fixed charges favor centrifugal pumps. G. H. Gibson, il plan Eng N 74:886-8 N 4 '15

'15 in

se in operating costs due to pump-Minidoka irrigation project. Eng & ing.

rigation pumping in the coast states, il map Elec W 65:1399-1408 My 29 '15 New well water supply of Galveston, Texas. H. G. Wheaton, il Eng & Contr 44:385-6 N

Saving \$1,500 a month by using electric pumps. E. E. Yensel. il diag Elec W 66:400-1 Ag 21

Study of a water supply by pumping for concrete road construction, plan Eng & Contr 43:467-8 My 26 '15 Water service tests, P. M. La Bach, Ry Age 59:536 S 17 '15

Pumping engines
Defective valves cause slippage in pumping
engines. A. A. Wood, il Eng Rec 71:598 My

Evolution of the waterworks pumping engine. W: B. Bryan, Engineer 118:570-1 D 11 '14 Famous Cornish pump, diags Power 42:124-5 Jl 27 '15

Pumping engines, Madras waterworks. il Engineer 119:188 F 19 '15 Service of a fuel oil engine in a railway pump-ing station. il Ry Age 58:1444-5 Je 18 '15

## Testing

Utility of pump slip tests in maintaining effi-ciency of pumping engines. H. D. Havill. Eng & Contr 44:293 O 13'15

Pumping machinery. See Pumping engines;

Pumping machinery, Electric
Automatic control of pumps to boost city
water pressure il Elec W 66:643 S 18 '15
Automatic electric control of pumps. G: J.
Kirchgasser, il diags Power 41:811-14 Je 15

Cost of electric pumping for irrigation, il map Elec W 66:68-71 Jl 10 '15; Same abr. Eng Rec 72:257-8 Ag 28 '15 Electric motors supplant steam for water pumping at Wellesley, Mass. Elec R & W Elec'n 67:147-8 Jl 24 '15

Electric pump wagon, R. E. Plimpton, il Munic Eng 49:28-9 Jl '15 Electrically driven, non-vibrating pumps, il Elec W 66:488 Ag 28 '15 Electrically driven water-works plant. E. M. Ivens, il plan Power 42:198-200 Ag 10 '15 Electrically operated pumping outfit, il Elec R & W Elec'n 67:684 O 9 '15; Elec W 66: 827 O 9 '15

827 O 9 '15
Electricity for irrigation pumping, il Elec R
& W Elec'n 66:1022-8 Je 5 '15
Electricity for municipal pumping, il Elec R
& W Elec'n 67:653-6 O 9 '15
Electricity replaces steam in drainage pumping, il Elec W 66:87 Jl 10 '15

Irrigating the land of little rain. S. M. Kennedy, il diags Elec W 65:1471-4 Je 5 '15

Irrigation in the Wenatchee valley. A. Gunn. il Elec W 65:1560-3 Je 12 '15

Minneapolis dredging pump operates electrically, il Eng Rec 72:136-7 Jl 31 '15

Motor-driven deep-well pumping head. il Elec R & W Elec'n 67:248 Ag 7 '15

Motor-driven house pump. il Elec W 66:1220

New vertical electric condensation return pump. il diag Heat & Ven 12:53-4 Ag '15

Pumping machinery, Electric—Continued
Pumping and loading sand; with tables of
costs. A. E. Smith. il Elec W 66:467-8 Ag 28

Saving \$1,500 a month by using electric pumps. E. E. Yensel, il diag Elec W 66:400-1 Ag 21 E. E. '15

Pumping stations

Baltimore sewage-pumping plant, W. O. Rogers. il Power 41:76-8 Ja 19 '15
Boston's new sewage pumping station. W. B. Conant. il Munic J 39:775-6 N 18 '15
California pumping station of the W. Gloucester water co. il diags Engineer 119:152-4 F 12 '15

Comparative steam and electric power layouts for a drainage pumping plant, plans Eng & Contr 42:412-14 O 28 '14 Concrete rings, superimposed, sunk to form San Antonio pump pit. W: W. Hay. il diag Eng Rec 71:741-2 Je 12 '15 Constructing Passaic valley pumping station. il plan Munic J 38:341-4 Mr 18 '15 Constructing pumping station in unbraced cofferdam formed by outside walls. il plans Eng Rec 71:292-4 Mr 6 '15 Dominguez central-station irrigation system. C. B. Loomis, plan map Eng N 74:540-1 S 16 '15 Drainage pumping plant with variable-speed

Drainage pumping plant with variable-speed drive. il diags Eng N 74:581-3 S 23 '15 Electric sewage-pumping station, Audubon, N. J. diag plan Eng N 73:73 Ja 14 '15 Electricity in waterworks plants. L. E. Dar-ling. Elec R & W Elec'n 66:869-71 My 8

Fairview sewage-pumping station. T: Wilson. il plan Power 41:286-7 Mr 2 '15

Indianapolis pumping station designed for continuous service. Eng Rec 71:208 F 13 '15 Irrigation by pumping at Del Rio, Texas.

A. Potter, il diags plan Eng & Contr 43:66-71

Ja 27 '15
Largest electric drainage pumping plant. A. M.
Shaw. Eng N 74:804-5 O 21 '15
Low-lift centrifugal pumps at Akron will
operate under unusually varied conditions.
F. A. Barbour, il Eng Rec 71:580-1 My 8 '15
Method employed in connecting suction tunnel
to pumping station wet well without draining the latter. H: W. Clausen. Eng & Contr
42:421-5 N 4 '14
Metarocepated pumping installation to handle

Motor-operated pumping installation to handle flood water in Boston, il Elec W 66:1206-7 N 27 '15

Municipal pumping stations of Detroit. T: Wilson, il Power 41:150-3 F 2 '15 Ornamental pumping station, il Munic J 39: 190 Ag 5 '15

Progress in Kansas in pumping equip-ment of the Appleton, Wis., water works. il plan Eng & Contr 44:244-6 S 29 '15 Progress in Kansas in pumping for irrigation. H. B. Walker. Eng & Contr 43:253-4 Mr 17

Pumping California crude oil. C. P. Bowie. il Eng N 74:1068-71 D 2 '15
Sewage pumping plants; brief descriptions of plants operating in seventy-five cities. Munic J 33:358-62 Mr 18 '15
Sewage pumping, screening and sterilizing station at Daytona, Fla.; specifications, plans Eng & Contr 42:525-7 D 2 '14
Turbine-driven water-works plant, Charlottetown, P. E. I. C. O. Thomas. il Power 42: 504-5 O 12 '15
Types and properties of deep well pumps. G: W. Bissell. Eng & Contr 44:33-4 Jl 14 '15

Variable-speed pumping plant for a drainage district, diags Eng N 74:918-19 N 11 '15 Whitton pumping station of the Ipswich cor-poration waterworks: abstract, C, W, S, Oldham, Engineer 118:588 D 18 '14

also Pumi it. Pumps; Water supply engineering; Waterworks

Pumps

Automatic control of step-bearing oil pumps, il diag Elec W 65:297 Ja 30 '15
Automatic pumping equipment, F, J, Vevia. plan Elec R & W Elec'n 66:1060 Je 5 '15
Bit of pump history. Colliery 35:389 F '15

Capacity and power of hydraulic pumps. R. A. Lachmann. Power 41:89 Ja 19 '15

Choice of pumps for city water works. J. E. Craig. Eng & Contr 43:171 F 24 '15 Control for boiler-feed pumps and piping connections. plan Elec W 66:918-19 O 23 '15 Dayton power pump. il Power 41:165-6 F 2 '15 Deane high-pressure pump. il Power 42:501-2 O 12 '15

Deep well pumps, il Metal Work 84:223 Ag 13

Deep well pumps. il Metal Work \$4:223 Ag 13 '15
Duplex pumps. A. L. Haas. Int Marine Eng 20:363-4 Ag '15
Efficiencies of mine pumps. P. E. Barbour. Eng & Min J 99:1031-2 Je 12 '15
Electrically operated house pump. il Elec R & W Elec'n 67:635 O 2 '15
Equipment and methods in largest refrigeration system. C: H. Bromley. il diags Power 40:914-16 D 29 '14
Influence of disk friction on turbine pump design. F. zur Nedden. diags Am Soc M E J 37:538-44 S '15; Abstract. Int Marine Eng 20:366 Ag '15; Discussion. Am Soc M E J 37: 545-6 S '15
Low-lift screw pumps installed at Terrebonne, La. il diag Eng N 74:313 Ag 12 '15
Luitwieler double-acting triplex pump. il Power 41:750 Je 1 '15
Men and machinery of the Comstock—the combination shaft. G. W. Dickie. il Eng & Min pumping; comparison of steam and electric pumps. C: Legrand. Am Inst Min E Bul 105:1929-35 S '15
Multistage centrifugal and Cornish pumps in Chapin prine L. B. Lyes il diag Frag & Min

Multistage centrifugal and Cornish pumps in Chapin mine. L. E. Ives. il diag Eng & Min J 99:857-8 My 15 '15 New diaphragm pump. il Met & Chem Eng 13:455-6 Jl '15

13:45-6 JI '15
Notes on elevator pumps. T: J. Rogers. diags Power 41:741-2 Je 1 '15
Pump regulator. A. H. Bullard. diag Power 41:754 Je 1 '15
Pumping for irrigation studies. Eng & Contr 44:96 Ag 4 '15
Pumps for city water works. J. E. Craig. Munic Eng 49:69-70 Ag '15
Reciprocating-pump slippage. M. K. Baer. Power 40:927-8 D 29 '14
Saving in the pump room. W: E. Dixon. diag Power 41:71-2 F 2 '15
Screw pumps for the drainage works at New Orleans. il plans Engineer 119:460-1 My 7 '15

Selecting a pump for general service. C: L. Hubbard. diags Power 41:198-9 F 9 '15; Discussion. 41:345-6, 519-20 Mr 9, Ap 13 '15 Selection of deep well pumping machinery. D. A. Graham. Eng & Contr 43:104-6 F 3 '15; Same. Engineer 120:164-5 Ag 13 '15; Abstract. Eng N 73:184 Ja 28 '15; Abstract. Eng Rec 71:204-5 F 13 '15 Slippage of reciprocating pumps. T. B. Hyde. Power 41:468-9 Ap 6 '15 Suction lift for pumps. D: Fliegelman. Power 42:150-1 Ag 3 '15

To calculate a pump's duty. Power 42:81 Jl 20 '15

Two ways of nining steep.

Two ways of piping steam pumps. W. H. Wakeman, diags Dom Eng 72:138 Jl 31 '15 Viking rotary pump, il diag Munic J 39:597-8 O 14 '15

Water level in air chambers. G: A. Weindel. diags Power 42:623 N 2 '15 Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:254-6 Ag 28 '15

See also Air lifts; Air pumps; Pumping stations; Tire pumps

## Cost of operation

Economical duty of pumps. F. H. Carter. Eng Rec 70:618-20 D 5 '14

#### Repair

Accident to pump plunger and how repaired. G: H. Wallace. diags Power 41:691 My 18

## Testing

See Pumps, Centrifugal-Testing

Pumps, Centrifugal Blast-furnace plant auxiliaries and general arrangement. J. E. Johnson, jr. diags Met & Chem Eng 13:373-8 Je '15

Pumps, Centrifugal Continued
Boiler-feed pump discussion. B. N. Everett.
Power 42:424 S 21 '15
Centrifugal boiler-feed pumps. A. L. Cóvill;
W. L. Durand. Power 42:276 Ag 24 '15
Centrifugal boiler-feed pumps. C: C. Richardson. Power 42:132 J 127 '15
Centrifugal boiler feed pumps. C. O. Sandstrom. Power 42:275-6 Ag 24 '15
Centrifugal boiler-feed pumps. J. E. Kamps.
Power 42:693-4 N 16 '15
Centrifugal boiler-feed pumps. T. D. Hayes.
Power 42:347 S 7 '15
Centrifugal crude-oil pump. A. B. Morrison,
jr. Power 41:454-5 Mr 30 '15
Centrifugal dredging pump applied to production of sand and gravel. il Concrete Cem 7:
191-2 N '15
Centrifugal mine pumps on the Rand; with

ton of sand and gravel. If Concrete Cem 7: 191-2 N '15
Centrifugal mine pumps on the Rand; with cost data. E. G. Izod and A. P. Rouillard, diags Eng & Min J 99:1115-16 Je 26 '15
Centrifugal pump became air bound. F. Mc-Morrow. Power 41:854 Je 22 '15
Centrifugal pump for thick liquors. il Met & Chem Eng 18:512 Ag '15
Centrifugal pump from standpoint of central station. T. D. Rose. il Elec R & W Elec'n 67:7-12 Jl 3 '15
Centrifugal pumps for boiler-feed service. E: S. Adams. Power 40:934-5 D 29 '14
Centrifugal pumps for fire engine service; abstract. A. Schacht. Am Soc M E J 37:408-9 Jl '15

Ji '15
Characteristic curves of centrifugal pumps: with discussion. F. W: Greve, jr. W Soc E J 19:776-87 O '14; Abstract. Am Soc M E J 37: 59-60 Ja '15
Comparing triple-expansion and centrifugal pumps. G: M. Peek; G: H. Gibson. Eng N 74:1044-5 N 25 '15
Concrete patches repair centrifugal dredging pump. W. L. Grace. il Eng Rec 72:147 Jl 31 '15
Condition gage for centrifugal pumps. G: M.

'15
Condition gage for centrifugal pumps. G: M. Peek, diag Eng N 72:1268 D 24 '14
Direct-driven and geared centrifugal pumps, Ross pumping stations, Pittsburgh, il Eng N 73:134-5 Ja 21 '15
Dredge pump handles ashes. O. D. Havard, diag Power 41:580 Ap 27 '15
Effect of temperature on capacity of centrifugal pumps. J: Howard. Power 41:406 Mr '93 '15

23 '15

Effect of velocity head on centrifugal pumps.
S. Wilcox. Power 42:487 O 5 '15

Hill-Tripp centrifugal pump. il diags Power
41:634-6 My 11 '15

Kingsford double-flow pump. il Power 41:85-6

Ja 19 '15

Largest centrifugal pump. il Sci Am S 79:37

Ja 16 '15

Low-lift centrifugal pumps at Akron will
operate under unusually varied conditions,
F. A. Earbour, il Eng Rec, 71:580-1 My 8

'15

'15

Multistage centrifugal numps. il diag College

Multistage centrifugal pumps. il diag Colliery

Ministage centrifugal pumps. It diag Collery 25:410-11 Mr '15.

Priming a centrifugal pump. E. M. Ivens. il diags Power 41:880-2 Je 29 '15.

Priming a centrifugal pump. J. E. Poche. diags Power 41:550 Ap 20 '15.

Priming a centrifugal pump. J. F. Jones. diags

Priming centrifugal pumps. C: A. Bunting. diag Power 42:275 Ag 24 '15
Southwark-Rateau centrifugal pumps. il diag Colliery 35:495-7 Ap '15
Steam-turbine-driven centrifugal pumps of the Toronto water works. il Eng & Contr 43:548-9 Je 23 '15
Various sizes, types, services and drives ocentrifugal pumps. il Munic. L 30:857.8 p. 0

arious sizes, types, services and drives of centrifugal pumps. il Munic J 39:857-8 D 2 '15

#### Cleaning

Cleaning a centrifugal pump. Colliery 35:260-1

## Testing

High duty obtained from small booster pumps. Eng Rec 72:79-80 Jl 17 '15 How low fixed charges favor centrifugal pumps, G. H. Gibson. il plan Eng N 74:886-8

pumps. G. H. Gibson, il plan Eng N 74:886-8 N 4 '15 New graving dock at South Shields, il diag plan Engineer 120:154-6, 158 Ag 13 '15

Salt solution method used for testing centri-fugal pump. B. D. Moses. il Eng Rec 72:137-8 Jl 31 '15

Single-stage centrifugal pumps, E. B. Wilson, il diags Colliery 35:365-70 F '15
Test of booster pumps, il Power 41:338 Mr 9

Test of centrifugal motor-driven pumps, S. S. Rumsey and W. F. Schwedes, diags plans Am Inst Min E. Bul 94:2613-35 O 11; Abstract, Am Soc M. E. J. 36:0214 N. 14; Discussion, Am Inst Min E. Bul 100:902-9

Ap '15
Testing small centrifugal pumps. A. A. Wood, diag Power 41:616 My 4 '15
Testing small centrifugal pumps. M. R. Blish, diags Power 41:370-3 Mr 16 '15
Testing small centrifugal pumps. R. L. Daugherty. Power 41:551-2 Ap 20 '15
Water-supply booster pumps; Roseland station, Chicago, il diag Eng N 73:744-5 Ap 15 '15

Pumps, Gas
First large American-built Humphrey pump.
C: C. Trump. il diags Power 40:767-70 D 1
'14; Same. Eng N 73:154-8 Ja 28 '15;
Abstract. Ind Eng 15:26-7 Ja '15
Humphrey pump: recent developments. C: C.
Trump. il diags Sibley J 30:55-9 N '15
Irrigation by pumping at Del Rio, Texas.
A. Potter. il diags plan Eng & Contr 43:6671 Ja 27 '15; Same abr. Eng Rec 71:596-8
My 8 '15

## Pumps, Tire, See Tire pumps

Pumps, Tire. See Tire pumps

Punching machinery
Hydraulic punch for track spike slots: il Elec
Ry J 46:195 J1 31 '15
Large multiple punching machine. il Iron Age
96:291 Ag 5 '15
Multiple hand punch. J; Leafstrom. diag Mach
21:747 My '15
Safety feed increases production of punch
press. il Iron Age 95:1333-4 Je 17 '15
Spacing table in the structural shop: equipment in Fort Pitt bridge works. G: P.
Thomas. il Iron Age 95:139-41 Ja 14 '15
Sub-press for blanking mica insulators. W. C.
Betz. diags Mach 21:407-8 Ja '15
Yoke riveting and punching machine. il Iron
Age 95:1398 Je 24 '15

Punctuation

## Punctuation

unctuation
Parenthetical clauses. W. P. Root. Inland Ptr
55:477-8 Jl '15
Punctuating quotations. F. H. Teall. Inland
Ptr 56:381 D '15
Varying styles and proofreading. F. H. Teall.
Inland Ptr 55:614-16, 756-9; 56:58-9, 202-3 Ag-

See also Compound words

See also Compound words

Purchasing
Broad field of the purchasing agent. E. C.
Church. Eng M 49:420-1 Je '15
Buying suggestions made by successful men.
Metal Work 83:423-6 Mr 19 '15
Fuel-supply contracts and the progress of more scientific methods of purchase and control in America and Europe. J: B. C.
Kershaw. Met & Chem Eng 13:393-6 Je '15
Interesting and important law about buying goods. E. J. Buckley. Elec R & W Elec'n 67:335 Ag 21 '15
Judicious buying of plumbing materials. Metal
Work 83:59-60 Ja 1 '15
Philosophy of correct purchasing. E. C.

Philosophy of correct purchasing. E. C. Church. Iron Age 95:1008-9 My 6 '15

Purchasing agent and high-class product. W: H. Morse. Eng M 49:333-5 Je '15

Purchasing and distributing supplies in Cleveland. A. R. Callow. il Munic J 39:391-4 S 9

Purchasing for scattered factories. H. L. Evans. Iron Age 95:283-8 F 4 '15
Purchasing supplies for the Panama canal. F. C. Boggs. Iron Age 96:1180-2, 1226-7 N 18-25 '15

Records for the purchasing department. H. A. Russell. Iron Age 96:308-9 Ag 5 '15

Systematic purchase and care of mill supplies. E. C. Church. Textile World 49:2079 My '15

See also Inspection

Pycnometer

Provided the Common of Programmeter for liquids, P. B. Pavis and L. S. Pratt, diag Am Chem Soc J 37:1199-1200 My '15

Pyrheliometer
Solar radiation, C. G. Abbot, F. E. Fowle and
L. B. Aldrich, Sci Am S 80:258-9 O 23 '15

Pyridine Salts of acridine, pyridine and quinoline. L. H. Cone. Am Chem Soc J 36:2101-10 O '14

Pyrimidines Researches on pyrimidines: alkylation of 2-mercaptopyrimidines. T. B. Johnson and H. W. Haggard. Am Chem Soc J 37:177-83 Ja 15

Ja '15
Researches on pyrimidines: new methods of synthesizing 2-ketopyrimidines and their sulfur analogs. T. B. Johnson and A. W. Joyce. Am Chem Soc J 37:2151-64 S '15
Researches on pyrimidines: pyrimidine aldehydes and their biochemical interest. T. B. Johnson and L. H. Cretcher, jr. Am Chem Soc J 37:2144-51 S '15
Researches on pyrimidines: synthesis of 4-phenylcytosine. T. B. Johnson and E. H. Hemingway. Am Chem Soc J 37:378-83 F '15

Researches on pyrimidines; synthesis of the pyrimidine nucleoside, 4-hydroxymethyluracil. T. B. Johnson and L: H. Chernoff. Am Chem Soc J 36:1742-7 Ag '14
Researches on pyrimidines; the synthesis of 4-hexyluracil and its relationship to uracilglucoside. T. B. Johnson. Am Chem Soc J 36:1891-9 S '14

Pyrite

Cave deposit, G; J, Young, diag Econ Geol 10:186-90 F-Mr '15 Grong copper and pyrites mines of Norway, A, D, Udhany, il map Eng & Min J 99:889-92 My 22 '15

My 22 '15
Pyrite in coal measures. Colliery 35:251 D '14
Pyrite is melting. E. D. Peters. Eng & Min J
98:1134-5 D 26 '14
Pyrites in 1914. Eng & Min J 99:148 Ja 16 '15
Pyritic smelting at Mount Lyell. R. Sticht,
Met & Chem Eng 13:116-18 F '15
Pyritic smelting; discussion. Am Inst Min E
Bul 100:739-61 Ap '15
Results of some co-operative work on determination of sulfur in pyrites. H. C. Moore.
J Ind & Eng Chem 7:634-6 Jl '15
Rotary kilns for desulphurization and agglomeration. S: E. Doak. Am Inst Min E Bul
105:2061-6 S '15; Same. Iron Age 96:574-6 S

Pyrogallol Reagents for use in gas analysis; alkaline pyrogallol, R. P. Anderson, diag J Ind & Eng Chem 7:587-96 Jl '15

Pyroligneous acid. See Acetic acid

Pyrometers and pyrometry
Base metal pyrometer couples. Mach 21:727

Characteristics of radiation pyrometers. G: K. Burgess and P. D. Foote. il diags U S Bur Stand Bul 12:90-178 O 28 '15; Abstract. J Fr Inst 179:493-5 Ap '15

Finding the transformation points in steel. E. F. Lake. il Mach 21:711-14 My '15

High-resistance pyrometers, Power 42:56 Jl 13

Machine that measures the heat of stars. il Sci Am 113:49 Jl 10 '15

Measurement of the temperature of molten metals. C: R. Darling. Engineer 118:611 D 25

Measuring high temperatures by melting of metallic salts. il Elec W 65:124-5 Ja 9 '15; Elec Ry J 45:106 Ja 9 '15; Foundry 43:39 Ja '15; Heat & Ven 12:54 Ja '15; Horseless Age 35:40 Ja 6 '15; Iron Age 94:1491 D 31 '14; Ry Age (Mech ed) 89:46-7 Ja '15; Iron Tr R 56:130 F 25 '15

Multiple-type recording instrument for pyrometers. il Met & Chem Eng 13:643 S 15 '15

New high-resistance pyrometer instruments. il Elec R & W Elec'n 66:1068-9 Je 5 '15

Pyrometers for shop use. J. M. Johnson. diags Mach 21:550-3 Mr '15; Same. Sci Am S 80: 156-8 S 4 '15

Radiation pyrometers; sources of error in the Féry and Thwing. G: K. Burgess and P. D. Foote. Iron Age 96:196-7 Jl 22 '15 Recent progress in pyrometry. C. R. Darling. Eng & Min J 100:519 S 25 '15 Senturel pyrometers and paste and their uses. il Met & Chem Eng 13:192-3 Mr '15 Tapalog, a new multiple record pyrometer recorder. il Met & Chem Eng 13:260-1 Ap '15; Iron Age 95:609 Mr 18 '15; Elec W 65: 871 Ap 3 '15; Power 41:541 Ap 20 '15 Testing and repairing pyrometers. J. Lucas. il Power 41:712-14 My 25 '15

See also Micropyrometers

Pyrophoric alloys
Court of appeals decision in the pyrophoric
alloy suit. Met & Chem Eng 13:145-6 Mr '15

Alunite and pyrophyllite in triassic and jurassic volcanics at Kyuquot Sound, British Columbia. C: H. Clapp. diag Econ Geol 10: 70-88 Ja '15 Pyrophyllite

Quantity surveying

Better estimating and contract methods as advocated by the American institute of quantity engineers, G. A. Wright. Assn Eng Soc J 54:168-9 Ap '15

Comment on cost of quantity surveys of buildings and a proposed survey guarantee.

W. K. Palmer. Eng & Contr 43:518-19 Je 9

survey. Estimating contracts by quantity surve G. A. Wright. Metal Work 83:502-4 Ap

Estimating curves for standard bridges of the Illinois highway department. G. F. Burch. il diags Eng & Contr 43:123-6 F 10 '15; Same cond. Eng Rec 72:171-2 Ag 7 '15

How quantity competition can be eliminated. H. M. Saumenig. Eng Rec 72:566 N 6 '15

Is the quantity system necessary? J. T. Tubby, jr. Am Inst Arch J 3:177-9 Ap '15

Qualifications of a quantity surveyor. Bldg Age 37:50-2 Mr '15

Quantity system. G. A. Wright. Am Inst Arch J 3:38-9 Ja '15

Quantity system of estimating. A. W. Joslin. Bldg Age 37:49-52 S '15

Quantity system of estimating. D. S. Ballantine. Bldg Age 37:41 Jl '15

Quantity system of estimating; an American method compared with the London system. A. G. Duke. Bldg Age 37:35-6 My '15

Report of committee of the Engineers' club of St. Louis. Assn Eng Soc J 54:8-11 Ja '15

## Laws and regulations

t. Louis law on quantity surveying. Eng N 73:282-3 F 11 '15 t. Louis ordinance governing quantity sur-veyors. Eng & Contr 43:187 Mr 3 '15

Quarries and quarrying

Cart for rock quarrying Cart for rock quarries, G: B. Wilson, il Eng & Min J 90:355 F 20 15 Electrical equipment of the Vermont marble company, J: Liston, il Gen Elec R 18:1015-25 N 15

Electricity in marble quarrying, il Elec R & W Elec'n 67:963-6 N 27 '15 Electricity in stone quarries and asphalt plants, il Elec R & W Elec'n 67:315-18 Ag 21 '15

21 '15
Modern rock-crushing plant. P. K. Yates. il plans Eng N 73:582-5 Mr 25 '15
Primer on explosives for metal miners and quarrymen. C: E. Munroe and C. Hall. diags U S Bur Mines Bul 80:63-71 '15
Quarrying slate for structural purposes. il Metal Work 84:445-6 0 1 '15
Safety in stone quarrying. O. Bowles. il U S Bur Mines Tech Pa 111:1-46 '15

See also Blasting; Building stones

uartz
Absorption, reflection, and dispersion constants of quartz. W. W. Coblentz. U S Bur Stand Bul 11:471-81 My 10 '15 Quartz veins in lamprophyre intrusions. J: F. McLennan. Eng & Min J 99:11-13 Ja 2 '15

Quartz lamps. See Electric lamps, Mercury vapor Quebec (city)

Bridges

Building the new Quebec bridge; the world's largest truss span, il Iron Tr R 56:562-3 Mr

largest truss spain. It from 17 K 36.362-3 Mills 18 15.

Design of the main shoes of the new Quebec bridge, il diags Engineer 118:527-8 D 4 '14

Erection of new Quebec bridge. H. P. Borden. il Eng Rec 71:80-1 Ja 16 '15

Erection progress on the Quebec bridge. il Eng & Contr 44:170-1 S 1 '15

Erection traveler, new Quebec bridge. H. P. Borden. il plans Eng N 73:417-22 Mr 4 '15

New methods evolved in building world's largest bridge: Quebec erection. il Eng Rec 72:96-100 Jl 24 '15

Progress of erection of the new Quebec bridge. il plate (supp) Engineer 120:416-17 O 29 '15

Progress of the new Quebec bridge. il plan Engineer 119:101-3 Ja 29 '15

Provision for traction stresses in Quebec bridge. C. A. Norton. diags Eng Rec 71:492-3 Ap 17 '15

Quebec-bridge camp and yards. il plan Eng N

Quebec-bridge camp and yards, il plan Eng N 74:748-9 O 14 '15 Quebec bridge work in 1915, il Eng N 74:473-5 S 2 '15

Work on the new Quebec bridge during the first erection season. H. P. Borden. il Eng N 73:1-4 Ja 7 '15

Quicksilver, See Mercury

Quincy, Illinois

Water supply

ew water filtration plant. W. R. Gelston. il diag Am Water Works Assn J 2:446-52 Je '15; Same. Munic Eng 48:297-8 My '15; Discussion. Am Water Works Assn J 2:452-4 Je '15

Quinine

Quinine in the treatment of gaseous gangrene. K. Taylor. Sci Am S 80:242-3 O 16 '15 Quinoline

Salts of acridine, pyridine and quinoline. L. H. Cone. Am Chem Soc J 36:2101-10 O '14

Quirigua, Guatemala, C. A.

Antiquities

Use of glue molds under serious difficulties N. M. Judd. il Concrete Cem 6:151-4 Mr '15 Same. Sci Am S 80:56-7 Jl 24 '15

Radiation

Characteristics of radiation pyrometers. G; K. Burgess and P. D. Foote. il diags U S Bur Stand Bul 12:90-178 O 28 '15; Abstract. J Fr Inst 179:493-5 Ap '15
Controlling infra-red emission. W. W. Coblentz. Elec W 66:1155-6 N 20 '15
Difficulty of measuring heat, with special reference to radiated and convected heat. A. H. Barker and F. C. S. Brendal. Heat & Ven 12:21-4 My; 33-4 Je '15
Electromagnetic radiation from the viewpoint of the electron theory. J. P. Minton. diags Gen Elec R 18:387-97 My '15
Emissivity of metals and oxides. G. K. Burgess and P. D. Foote. diags U S Bur Stand Bul 11:41-64 N 15 '14
Emissivity of metals and oxides; iron oxide. G; K. Burgess and P. D. Foote. U S Bur Stand Bul 12:83-9 O 28 '15
Emissivity of metals and oxides; measurements with the micropyrometer. G. K. Burgess and R. G. Waltenberg. U S Bur Stand Bul 11:591-605 My 27 '15
Emissivity of metals and oxides; the total emissivity of platinum and the relation between total emissivity and resistivity. P. D. Foote. U S Bur Stand Bul 11:607-12 My 27 '15
Heat emitting capacity of radiation. C: D.

Heat emitting capacity of radiation, C; D, Allan. Heat & Ven 12:32-4 Ag. '15 Measurements on standards of radiation in absolute value, W, W, Coblentz, U S Bur Stand Bul 11:87-96 N 15 '14

New radiation computing disk, il Heat & Ven 12:54-5 Ag '15
Radiation pyrometers; sources of error in the Féry and Thwing. G; K. Burgess and P. D. Foote. Iron Age 96:196-7 Jl 22 '15
Visibility of radiation. P. G. Nutting. Illum Eng Soc 9:633-42 no 7 '14
Visibility of radiation in the red end of the visible spectrum; abstract. E; P. Hyde and W. E. Forsythe. Elec W 66:464 Ag 28 '15

\*\*Ser also. Cathode pract. Heat prediction:

See also Cathode rays; Heat radiation; Heating—Tables, calculations, etc.; Light; Radiators; Radioactivity; Radiometer; Ul-tra-violet rays; X rays

Radiation, Solar, See Solar radiation

Radiators

adiators
Coefficient of heat transmission in a pressed steel radiator. J: R. Allen. plans Am Soc Heat & V E 20:86-91 '14; Same. Heat & Ven 11:30-3 Mr '14; Same. Metal Work 81:207-9 Ja 30 '14; Same. Dom Eng 66:166-7 F 7 '14; Same cond. Ind Eng 14:171 Ap '14; Discussion. Am Soc Heat & V E 20:91-3 '14 Effect of radiator decoration. T: Tait. Dom Eng 72:341-2 S 18 '15

Ellectro-thermostatic control of radiators, Sci Am 112:364+ Ap 17 '15 Gas radiator, il Metal Work 84:257 Ag 20 '15 Gas-steam radiator, il Heat & Ven 12:51-2 S

Gas-steam radiators. il Sci Am 113:255 S 18

Heaf emission from radiators. E: D. Bottsford. Heat & Ven 12:49 S '15 Heat from radiators under different tempera-tures. C: A. Fuller. Heat & Ven 12:32-5 Mr

'15
How radiator cores are made efficiently, E. C. Kreutzberg, il Foundry 42:471-3 D '14
Position of radiators in rooms, W. F. Verner, Metal Work 84:15 Jl 2 '15
Radiator traps and test data, L. M. Arkley, diag Heat & Ven 12:37-9 S '15
Rathbone electric hot-water radiator, il Elec R & W Elec'n 67:588-9 S 25 '15
Standard methods of proportioning direct radiation and standard sizes of mains, J. A. Donnelly, Donn Eng 73:2-1 O 2 '15
Tests on the heat transmission of direct radia-

Tests on the heat transmission of direct radiaests on the heat transmission of direct radia-tors at low differences in temperatures. J. A. Donnelly. diag Heat & Ven 11:36-7 S '14; Same. Am Soc Heat & V E 20:405-7 '14; Same. Dom Eng 68:65 Jl 18 '14; Discussion. Heat & Ven 11:38-9 S '14; Discussion. Am Soc Heat & V E 20:408-11 '14

See also Automobiles-Radiators

Radiators, Electric. See Electric radiators Radicals (chemistry)

triphenylmethyl; preparation of p-hydroxy-triphenylcarbinol and attempts to isolate the corresponding triarylmethyl. M. Gom-berg and R. L. Jickling. Am Chem Soc J 37: 2575-91 N '15

Radioactive substances
Birth-time of the world: methods of determining its age. J. Joly. Sci Am S 79:78-9 Ja 30

Extraction and separation of the radioactive constituents of carnotite. H. M. Plum. Am Chem Soc J 37:1797-1816 Ag '15

Periodic law. S. Dushman. Gen Elec R 18:617-21 Jl '15

Radio-active fertilizers. Sci Am S 79:53 Ja 23

Radium as a fertilizer. Sci Am 112:396 My 1

Carnotite: Mesothorium; Radio-See also activity; Radium; Thorium

Radioactivity

Influence of radio-active earth on plant growth H. H. Rusby, il Sci Am S 79:216-18, 228-30 Ap 3-10 '15

Radio-active ores and plant life. H. Bastin. il Sci Am 112:335 Ap 10 '15

Radioactivity; advances in a theory that has enabled us to study natural transmutation. Sci Am S 80:50-1 Jl 24 '15

See also Cathode rays; Electrons; Helium; Radiography; Radiotherapy; Radium; X

Radiography

Adiography
Application of the Coolidge tube to metallurgical research. W. P. Davey. il Gen Elec R 18:134-6 F '15; Same. Iron Age 95:500-1 Mr 4 '15; Same. Sci Am S 79:331 My 22 '15; Same, with description of Coolidge tube. Engineer 119:350-1 Ap 9 '15
Finding blowholes with the X-rays. C. H. Tonamy. il diags Foundry 43:455-6 N '15; Same cond. Iron Age 96:1054-5 N 4 '15
Model X-ray dark-room. W. P. Davey. plans Gen Elec R 18:1107-10 D '15
Radiography of metals. W. P. Davey. il Am Inst Min E Bul 104:1515-25 Ag '15; Same. Gen Elec R 18:795-800 Ag '15; Same cond. Iron Age 96:522-4 S 2 '15; Abstract. J Fr Inst 180:489-90 O '15
Röntgen motion pictures; the Dessauer process. il Sci Am 112:312 Ap 3 '15
Roentgen photographs of plants. il Sci Am 113:164 Ag 21 '15
X-ray inspection of a steel casting. W. P.

113:154 Ag 21 '15'
-ray inspection of a steel casting, W. P. Davey, il Gen Elec R 18:25-7 Ja '15; Same, Iron Age 95:186-7 Ja 21 '15; Same, Sci Am S 79:84 F 6 '15; Same, Eng M 49:106-7 Ap '15; Same, Ry Age (Mech ed) 89:170 Ap '15-ray work in war, il Sci Am S 79:120-1 F 20

X-ray

Radiometer

Comparison of stellar radiometers and radiometric measurement on 110 stars. W. W. Coblentz, il diags U S Bur Stand Bul 11: 613-56 My 27 '15

Difficulty of measuring heat, with special reference to radiated and convected heat. A. H. Barker and F. C. S. Brendal. Heat & Ven 12:24 My '15

Three methods of measuring radioat had for

Three methods of measuring radiant heat from gas fires. W. R. Twigg, il diags Heat & Ven 12:33-6 S '15

Various modifications of thermopiles having a continuous absorbing surface. W. W. Cob-lentz. pls U S Bur Stand Bul 11:131-87 N 15

Radiomicrometer

Radiometric measurements of the ionization constants of indicators. E. J. Shaeffer, M. G. Paulus, and H. C. Jones. diags Am Chem Soc J 37:776-807 Ap '15

Radiotelegraphy. See Wireless telegraph Radiotelephony. See Wireless telephone

Radiotherapy Radium treatment of cancer. Sci Am S 79: 409 Je 26 '15

Radium water. Sci Am 111:473 D 5 '14

Uniformity in dosage of radium emanation W: J. Schieffelin. Sci Am S 79:123 F 20 '13

Radium

Bureau of mines radium production. Eng & Min J 100:194-5 Jl 31 '15

Discovery of radium in coal. Sci Am 112:423 My 1 '15

Industrial uses of radium. T. T. Baker. Eng M 49:597 J1 '15

Measurements of radium. Sci Am S 79:327 My

Practical methods for the determination of radium, S. C. L. I. il diag J Ind & Eng Chem 7:406-10 My '15

Progress of Bureau of mines radium work. F. K. Lane. J Ind & Eng Chem 7:720-1 Ag

Radium situation. W. F. Bleecker. Met & Chem Eng 13:143-5 Mr '15; Abstract. Eng M 49:102-3 Ap '15; Discussion. Met & Chem Eng 13:202 Ap '45

Radium: uranium ratio in carnotites. S. C. Lind and C. F. Whittemore. diags Am Chem Soc J 36:2066-82 O '14

Radium-uranium ratio in carnotites. \$\ \text{Lind}\ \text{and C. F. Whitten.en. il diags}\ \text{Bur Mines Tech Pa 88:1-28 '15}

Uniformity in dosage of radium emanation. W: J. Schieffelin. Sci Am S 79:123 F 20 '15 See also Pitchblende; Radioactivity; Radiotherapy

Radium water Radium water. Sci Am 111:473 D 5 '14 Raffinose

aminose
Estimation of raffinose by enzymotic hydrolysis. C. S. Hudson and T. S. Harding. Am
Chem Soc J 37:2193-8 S '15
Preparation of raffinose. C. S. Hudson and
T. S. Harding. Am Chem Soc J 36:2110-14 O

Rafts

Pontoon bridges and rafts, il Sci Am S 80: 116 Ag 21 '15

Ragweed

Bitter principle of common ragweed. B. E. Nelson and G: W. Crawford. Am Chem Soc J 36:2536-8 D '14

ail bonds
Brazed bonds on the Pacific electric and Los
Angeles railways. Elec Ry J 46:455 S 11 '15
Gas-weld rail bonding, J. R. Brown. il Elec
Ry J 46:1087-9 N 27 '15
Improved method of applying rail bonds. L. P.
Crecelius. il diag Elec Ry J 46:236-8 Ag 7

Rail failures. See Rails-Failures

Rail fastenings New rail fastening, diag Iron Age 95:673 Mr 25 '15

See also Rail bonds; Spikes (railroad)

Rail handling

Making records with loading machines. F. N. Loughnan. il Ry Age 58:1443 Je 18 '15

Rail joints

all joints
Automatically welded electric joints in Brooklyn, il Elec Ry J 44:1310 D 12 '14
Ballou safety bolt nut for rail joints, il Ry
Age 59:751-2 O 22 '15
Columbus uses new joint and track foundation, E. O. Ackerman, il diags Elec Ry J
46:956-7 N 6 '15

Emergency rail joint, il Ry Age 59:532 S 17

Joint repairs on American city railways. S. Gausmann. Elec Ry J 45:803-4 Ap 24 '15 New ideas in rail joints. diags Eng N 73:998-9 My 20 '15 New illinois Central standard joint. diag Ry Age 59:126 Jl 16 '15 Proposed standard specifications for quenched high-carbon steel splice bars. diag Ry Age 59:61-2 Jl 9 '15; Same. Iron Tr R 57:45 Jl 1

Rail-end connections for bascule bridges. il diag Eng N 73:1216-17 Je 24 '15 Rail joints and tie spacing, diags plan Eng N 72:1212-13 D 17 '14 Tests show satisfactory return-circuit conditions in Providence, R. I. Elec Ry J 46:825-6 O 16 '15

Track joint conditions and creeping rails, Ry R 57:653-4 N 20 '15

Rail laying. See Railroads-Track

Railings

ailings
Falling line system of hand railing. M. Williams. Bldg Age 37:59-60 My; 58-60 Jl '15
Laying out hand rail for spiral stairway.
M. Williams. diags Bldg Age 37:55-6 F '15
New type of gaspipe railing proves satisfactory at Cincinnati. E. K. Ruth. diags Eng Rec 72:198 Ag 14 '15
Two handrailing systems contrasted. M. Williams, diags Bldg Age 37:55-8 D '15

See also Guard rails (for highways)

Railings, Concrete Brushed concrete balustrade along Erie canal, Rochester, N. Y. il Concrete Cem 6:102-3 F

oncrete handrails on Kansas City terminal work, il Eng Rec 70:673 D 19 '14 Concrete

Railroad accidents. See Railroads-Accidents

Railroad associations

American railway mechanical associations. Ry Age 58:353 F 26 '15 Railroad bonds. See Railroads-Securities

Railroad bridges. See Bridges, Railroad Railroad construction. See Railroads-Construc-

Railroad crossings. See Railroads-Crossings

Railroad education Education for railway w Ry Age 59:907-9 N 12 '15 work. S: O. Dunn.

Railroad education Continued
Training of young men with reference to promotion. G: M. Basford, Ry Age 59:150-3 Jl

Training steam railroad men for electric operation. C. Roberts. il diag Elec Ry J 45:970-2 My 22 '15

See also Railroads-Employees

Railroad engineering

A. R. E. A. convention. Elec Ry J 45:570-1 Mr 20 '15

Mr 20 '15
A. R. E. A. 16th annual convention. Eng N
73:598-9 Mr 25 '15
A. R. E. A. 16th annual convention: committee
reports. Ry R 56:386-403 Mr 20 '15
A. R. E. A.: year's work reviewed. Eng Rec
71:374-7 Mr 20 '15
Railroads from the engineering point of view.
C. F. Loweth. Eng Rec 71:4-5 Ja 2 '15

Se also Railrond surveying; Railronds Construction; Railroads—Maintenance a repair; Wireless telegraph for railroa

Railroad engineers

See also Locomotive engineers

Railroad land

Railway real estate association 1st annual meeting. Ry Age 59:727-9 O 22 '15

Sec also Railroad land grants

Railroad land grants
United States mining statutes annotated.
J. W. Thompson. U S Bur Mines Bul 94:pt
2, 1099-1158 '15

Railroad law
Anti-full-crew law campaign. Ry Age 58:400,
444, 633-4 Mr 5-19 '15
Argument against extension of locomotive
boiler inspection service. Ry R 56:317-20 Mr

6 '15
Bill extending boiler inspection to entire locomotive. Ry R 56:127 Ja 23 '15
Bill for block signals, automatic stops, steel cars, headlights and investigations (Stevens bill). Ry R 56:125-7 Ja 23 '15
Commission on relations between railways and waterways. Ry Age 58:1037-8 My 21 '15
Commission's findings relative to the Cummins law. Ry Age 58:1049-51 My 21 '15
Conference on the Cummins amendment. Ry R 56:531 Ap 17 '15
Cost of train limit legislation. Ry Age 58:979-

Cost of train limit legislation. Ry Age 58:979-80 My 7'15

Cummins amendment. Ry Age 58:826-7 Ap 16

Decision on the Cummins amendment. Ry R 56:705-7 My 22 '15 Decisions of the United States Supreme court.

Defeat of the Missouri full crew law. O. M. Spencer. Ry Age 57:1036 D 4 '14 Extra crew laws. Ry R 56:272-3 F 27 '15 Full-crew law arguments. Ry Age 58:293-4 F 19 '15

Hand brakes outlawed. Ry Age 58:1018-19 My

Hours of service act interpreted as to tele-phone communications. Ry Age 59:496-7 S

17 '15
Illinois commission prescribes minimum clearances. Ry R 56:633-6 My 8 '15; Excerpt. Ry
Age 58:940 Ap 30 '15
Limiting length of trains by law. M. W. Potter. Ry Age 58:268 F 12 '15
Limiting the length of trains. Ry Age 58:392
Mr 5 '15
Mr 15 '15
Mr 15 '15

Limiting the length of trains. Ry Age 58:392 Mr 5 '15 New railroad legislation in fifteen states. Ry Age 59:23-5 Jl 2 '15 New York merchants propose amendment to the Cummins act. Ry R 57:699 N 27 '15 Possible railway securities legislation. W. L. Stoddard. Ry Age 59:946 N 19 '15 Prospects of railway legislation. W. L. Stoddard. Ry Age 59:812 O 29 '15 Railroad and the hobo. E. W. Camp. Ry R 57:396-7 S 25 '15; Same cond. Ry Age 59:460 S 10 '15 Railroads' appeal to New Jersey and Pennsylvania voters against full-crew laws. Ry Age 58:311-12 F 19 '15 Railroads must divorce lake steamship lines.

Railroads must divorce lake steamship lines. map Ry R 56:682-5 My 22 '15

Railroads of Pennsylvania and New Jersey on the extra-crew laws. Ry R 56:206 F 13 '15

Railways must abandon control of boat lines on the Great Lakes; abstract of the Interstate commerce commission's decision. Ry Age 58:1046-7 My 21 '15
Regulation of railway operation. W. J. Jackson. Ry Age 58:9-10 Ja 1 '15
Report of special committee on relations of railway operation to legislation. Ry Age 59: 945-6 N 19 '15
Results of the locametrica boiler increasion.

940-6 N 19 15 esults of the locomotive boiler inspection law. F. McManamy. Ry Age 58:621-2 Mr 19 '15; Same cond. Ry Age (Mech ed) 89:190-1 Ap '15; Same cond. Power 41:898-900 Je 29 Results

Roads allowed to retain car ferries. Ry R 56:

Roads allowed to retain the control of the school of the s Tendencies toward inefficiency in legislation.
R. Walker, Ry Age 58:220-1 F 5 '15

Train crew regulations in Connecticut. Ry Age 57:1118 D 18 '14 Street Berth law annulled. Ry Age 59: 1- 11 - 15

See also Grade crossing elimination; Interstate commerce; Locomotives—Inspection; Railroads—Rates; Railroads—Trespassing; Railroads and state

Bibliography

Minimum train crews and maximum length of trains legislation in the United States. Special Libraries 6:25-39 F '15

Railroad libraries

Sketches of railroad libraries. Special Libraries 6:1-13 Ja '15

Railroad maps

Platting topography to distorted scale (valua-. tion board requirement). Eng N 73:123-4 Ja

Railroad master blacksmiths' association, Inter-tional. See International railroad master blacksmiths' association

Railroad rates. See Railroads-Rates

Railroad regulation. See Railroads and state

Railroad shops. See Railroads-Shops

Railroad signals. See Railroads-Signals Railroad stations. See Railroads-Stations

Railroad superintendents, American association of. See American association of railroad

superintendents

Railroad supplies industry

American locomotive builders and foreign
trade. W. Fawcett. Ry Age 59:643-4 O 8 '15

Autocrat at the lunch table. B. V. Crandall.
Published in the weekly issues of the Railway review beginning October 17, 1914
List of exhibitors, June, 1915, conventions and
exhibition. Ry R 56:447-8 Mr 27 '15
Railroad supply exhibit, Atlantic City, June
9-16. Iron Age 95:1354-5 Je 17 '15
Railway supply man's point of view. See
weekly numbers of the Railway review
Selling railway supplies to European countries.
W. S. Hiatt. il Ry Age 59:901-4 N 12 '15

Railroad surveying

Railroad surveying Alaskan railroad surveys, D. L. Reaburn, il Eng N 73:104-6 Ja 21 '15

Lake traverses on railroad preliminary work. J. A. Mac Donald. Eng Rec 71:48 Ja 9 '15

Methods and instruments used in making precise surface and underground surveys for the Canadian Northern Ry. tunnel, Montreal, Canada. J. L. Busfield. il diags plan Eng & Contr 42:383-6 O 21 '14

Railroad switches. See Railroads—Switches, frogs, etc.

Railroad tie plates Effect of Lundie tie plates on rail wear. diags Ry Age 58:480 Mr 12 '15

Railroad supply co. wins its case against infringers of the Wolhaupter patents, il Ry R 56:60-6 Ja 9 '15

Thomas rail anchor tie plate, il Ry Age 59: 752 O 22 '15

Railroad ties

Adzing old ties in track. Ry R 56:659-60 My

Air seasoning of ties. A. H. Noyes. Ry R 56:

Air seasoning of ties, A. H. Noyes, Ry R 56: 111 Ja 23 '15
Behavior of treated ties in alkali soils. Elec Ry J 46:1002 N 13 '15
Creosoting of cross ties as practiced by American railroads, A. C. Steinmayer, il Assn Eng Soc J 54:110-20 Mr '15
Distribution and care of crossties, E. F. Robinson, Ry Age 58:855 Ap 16 '15
Justifiable expenditure for tie treatment, H. Emerson and T. T. Bower, Eng Rec 71: 106-7 Ja 23 '15; Same, Eng M 48:903-5 Mr '15; Summary, Ry Age 58:159-60 Ja 22 '15 Mechanical life of ties as affected by ballast, E. Stimson, Eng Rec 71:105-6 Ja 23 '15; Same, Ry Age 58:161 Ja 22 '15; Same, Ry R 56:119-21 Ja 23 '15
Pine ties reused by street railway after twenty-one years' service, R. C. Cram, Elec Ry J 45:295-6 F 6 '15
Pneumatic tie peeler, il Ry Age 59:342 Ag 20 '15

Proper supervision of tie renewals. A. W. Tabert. Ry Age 58:848 Ap 16 '15 Renewal of ties—inspection, marking and records. Ry Age 58:1073-6 My 21 '15

Renewing bridge ties on the Lehigh valley R. R. il Ry R 57:492-3 O 16 '15 Renewing ties in stone and earth ballasted track. P. J. McAndrews. Ry Age 58:847-8 Ap

Report of A. R. E. A. committee. Ry R 56: 394-6 Mr 20 '15 Seasoning of softwood ties. A. H. Noyes. Eng

Seasoning of softwood ties. A. H. Noyes. Eng Rec 71:105 Ja 23 '15 Sill ties—treated or untreated timber, or con-crete? F. J. Angier. Eng Rec 71:105 Ja 23 '15; Same. Ry Age 58:162 Ja 22 '15; Same. Ry R 56:367-8 Mr 13 '15 Standard methods of piling and marking ties on the Pennsylvania. il Ry Age 58:334-5 F

19 '15 Steel vs. wood ties in city track construction. J. A. Nester. il Elec Ry J 46:1089 N 27 '15 Tie preservation on the Baltimore & Ohio R. R.; abstracts. F. J. Angier. Ry Age 59:537-8 S 17 '15; Eng & Contr 44:396-7 N 17 '15; Ry R 57:630-3 N 13 '15

57:630-3 N 13 '15
Tie timber and the unnecessary wear and tear of track. G: E. Rex. Ry R 57:362-3 S 18 '15
Tie treating on the Boston & Worcester street railway. il Elec Ry J 45:678-9 Ap 3 '15
Tie treatment in British India. il Ry R 56: 248-9 F 20 '15
Treated cross-ties: discussion at convention of Am. wood preservers' association. Elec Ry J 45:182 Ja 23 '15
Treated ties on the Southern Pacific Ry. J. Q. Barlow. Eng N 74:1093 D 2 '15
Treatment of red oak ties. Ry Age 58:159 Ja 22 '15

Sec also !!adlroad tie plates; Railroads—Construction; Railroads—Track; Wood preservation

Cost

Annual cost of ties. J. G. Sullivan. Ry Age 59:352 Ag 20 '15
Determination of annual charge for ties, poles and fence posts. W. F. Goltra. Ry Age 58: 1087 My 21 '15
Diagrams for cost of ties; Canadian Pacific railway. Eng N 74:292 Ag 12 '15
Figuring the annual cost of ties. H. Emerson. Ry R 57:235-6 Ag 21 '15
Figuring the annual cost of ties. J. G. Sullivan. Ry R 57:74-5. 201 Jl 17, S 4 '15
Method for finding the annual charges for ties. H. Emerson and T. T. Bower. Eng & Contr 43:155-6 F 17 '15
Purchases in Canada during 1914. Ry Age 59: 970 N 19 '15
iailroad ties, Concrete

Railroad ties, Concrete

Reinforced-concrete N 74:77-8 Jl 8 '15 ties after service. il Eng

Railroad ties, Steel

Detail cost of track work with steel twin ties.

A. J. Wolfe, diags Elec Ry J 46:916-17 O 30
'15

Developments with steel ties on the Bessemer & Lake Erie R. R. il diags Ry R 56:10-11 Ja 2 '15

Four years of maintenance of a track crossing on steel substructure, C. A. Prentice. Elec Ry J 46:1044-5 N 20 '15 Slick steel mine tie, diag Colliery 35:342-4 Ja

Slick steel mine ties. il diags Ry R 56:436-7 Mr 27 '15

Mr 27 '15 Standard steel tie. il Ry R 57:537 O 23 '15 Steel mine ties, il Colliery 35:380-1 F '15 Steel tie construction in electrically-warmed concrete. J. M. Bamberger. il diag Elec Ry J 45:189-90 Ja 23 '15 Steel tie for universal service, il Elec Ry J 46:1002 N 13 '15

Steel ties under heavy traffic, il diags Ry Age 57:1147 D 18 '14 ties under hot ashes. il Ry R 56:875 Je

Railroad tracks. See Railroads-Track Railroad yards. See Railroads-Yards Railroads

Development of railways 1914. Engineer 119:17 Ja 1 '15 Ja 1

Ja 1 '15 Development of the steam railroad, il diags Sci Am 112:525-6+ Je 5 '15 Engineering considerations in a proposed line. Elec Ry J 45:512, 799 Mr 13, Ap 24 '15 International engineering congress meeting at

San Francisco; abstract of papers and discussions relative to railroads. Ry Age 59: 599-608 O 1 '15

W. B. Parsons. Elec Ry J 46:623-4 Railways. S 25 '15

S 25 15 Railways and prosperity. A. L. Mohler. Ry R 56:181-2 F 6 '15 To Cuba by rail. H. C. Plummer. il map Sci Am S 79:40-1 Ja 16 '15

Am S 19:40-1 Ja 16 16
See also Air brakes; Brakes; Bridges, Raitroad; Cable railroads; Car ferries; Cars; Electric railroads; Elevated railroads; Express companies; Freight car service; Freight cars; Hospital trains; Locomotives; Motor cars (railroad); Mountain railroads; Railroad engineering; Railroad land; Rails; Railway mail service; Street railroads; Subways; Suspended railways; Train dispatching; Trestles; Tunnels and tunneling

Accident bulletin no. 52. Ry Age 58:299-300

Accident bulletin no. 52. Ry Age 58:299-300 F 19 '15 British railway accidents. H. R. Wilson. Eng N 73:436 Mr 4 '15 Five years of safety first on the Chicago & Northwestern Ry. Ry R 57:180-1 Ag 7 '15 French railway accidents in war-time. W. S. Hiatt. Ry Age 59:1015-16 N 26 '15 Grade crossing elimination; comparison of casualties with automobile accidents. Ry Age 59:634-5 O 8 '15 Greina cullision. Ry Age 59:653 O 8 '15

Gretna collision. Ry Age 59:653 O 8 '15 Gretna railway accident. Engineer 119:535 My 28 '15

I. C. C C. accident reports. Ry Age 59:695-6 O

Interstate commerce commission quarterly ac-

cident report. Ry R 56:599-600 My 1 '15 Maximum rate of safe retardation for passenger cars and elevators. Eng N 72:1132-3 D 3 '14

Now safety first record for railways of the United States, Ry R 57:493 O 16 '15 New York Central awarded Harriman safety medal, Ry Age 58:271-2 F 12 '15 Quintinshill disaster. Engineer 120:293-4 S 24

Rail failures and train accidents. Eng N 72: 1160-1 D 10 '14 Railway accidents in the United States during

January, February, and March, 1914. Ry Age 57:1081 D 11 '14 Remarkable collision between an oil car and a steam locomotive. C: A. Byers. il Sci Am 113:269 S 25

Report on collision at Orient, Ohio. Ry Age 59: 947-8 N 19 '15

Report on the wreck at Tipton Ford, Mo., Kansas City Southern Ry. Ry R 55:694-5 D

Report on Thurmont, Md., collision. Ry Age 59:327 Ag 20 '15

Train accidents: rain accidents; monthly summaries pub-lished in the Railway age gazette

Railroads—Accidents Continued

28th annual report of the Interstate commerce
commission. Ry R 56;161-2 Ja 30 '15

Two notable train accidents. Ry Age 58:943
Ap 30 '15

While other accidents decline trespassing accidents etill increase Ry Age 59:453 S 10 '15

withing other accidents decline trespassing ac-cidents still increase. Ry Age 59:453 S 10 '15 Worst railway accident on record; collision at Gretna, England. Eng N 74:45-6 Jl 1 '15

See also Derailments; Railroads—Signals; Railroads—Safety devices and measures; Railroads—Trespassing

#### Accounting

Accounting for rail and ties. C; E. Parks. Ry Age 58:470 Mr 12 '15 Accounting for second hand serviceable ma-terial. C. H. Samson. Ry Age 58:1041-2 My 21 '15; Same. Ry Age (Mech ed) 89:285-6 Je

Accounting-material store expenses; Railway

Accounting—material store expenses; Railway storekeepers' association committee report. Ry Age (Mech ed) 89:287 Je '15
Association of transportation and car accounting officers. Ry Age 57:1192 D 25 '14
Cost accounting in the railroad repair shop. E. Cordeal. Eng M 49:211-17 My '15
Denver reclaim agreement. Ry Age 58:370 F 26 '15

Proposed bureau for clearing car repair accounts, C. F. Straub, Ry Age 59:161-2 Jl 23

Railroad accounting officer. H. W. Davies. Ry Age 58:1112 My 28 '15

Railroad accounting officer. H. W. Davies. Ry Age 58:1112 My 28 '15
Railroad's maintenance expenses allocated between freight and passenger service. Eng Rec 72:226-9 Ag 21 '15
Railway storekeepers' association: committee report on accounting—material store expenses. Ry Age 58:1043 My 21 '15

## Advertising

Railroad advertising, E: Hungerford, Ry Age 58:1012-14 My 14 '15 58:1012-14 My 14

#### Automatic stop

Automatic stop

Automatic cab-signal and train-stop system, il diags Eng N 74:614-16 S 23 '15

Buell's cab signal and automatic train stop, il diag Ry Age 59:904-5 N 12 '15

Cab signals and automatic stops at Oroville, F. F. Bostwick, Ry Age 59:998-1000 N 26 '15

Cab signals and automatic stops on the Western Pacific, il diags Ry Age 59:645-50 O 8 '15

Pevon and Uford, Pr. Age 59:094-45 80 115

'15
Devon and Ilford. Ry Age 58:921 Ap 30 '15
Julian train control and automatic stop. il
diags Ry Age 58:1481-2 Je 25 '15
New type of automatic railroad stop. il Sci
Am 113:186+ Ag 28 '15
Oroville signaling criticized. M. Tainer. Ry
Age 59:796-8 O 29 '15
Report on Gray-Thurber train control system.
Ry Age 58:304 F 19 '15

## Brakes

## See Air brakes; Brakes

## Buildings and structures

Concrete signal towers, Delaware Lackawanna & Western R. R. il plans Ry R 56:615-16 My 8 '15

Concrete work on the Arizona division of the Santa Fe. il diags Ry Age 58:849-52 Ap 16 '15

Santa Fe. il diags Ry Age 58:849-52 Ap 16 '15
Fuel oil stations for extreme climatic conditions, plan Ry Age 58:475-6 Mr 12 '15
Interlocking tower of stucco on hollow tile, Rock Island lines, E. G. Zorn, il diags Ry E. 57:108-9 JI 24 '15
Jersey Central service buildings at Jersey City have several novel features, il diags Eng Rec 72:70-1 JI 17 '15
New Delaware and Hudson office building at Albany, N. Y. M. T. Reynolds, il Concrete Cem 6:289-93 Je '15
Paint as an aid in making the public more friendly to the railroads, E: H. Brown, Ry Age 59:969 N 19 '15
Tools for the water service and bridge and building departments, E. M. Grime, Ry Age 59:340-1 Ag 20 '15
See also Bridges, Railroad; Car houses; Coaling stations; Freight houses; Locomotive shops; Railroads—Sanitation; Railroads

—Shops; · Railroads—Stations; Railroads—Storehouses; Railroads—Ticket offices; Railroads—Train sheds; Roundhouses

#### Cars

See Buffet cars; Cars; Dining cars; Freight cars; Motor cars (railroad); Refrigerator cars; Sleeping cars; Tank cars; Wrecking

#### Claims

Commission's findings relative to the Cummins law. Ry Age 58:1049-51 My 21 '15 Concealed damage. W. H. Streeter. Ry Age 59:856 N 5 '15

59:856 N 5 '15
Decision on the Cummins amendment. Ry R 56:705-7 My 22 '15
Effective freight claim preventive crusade. Ry Age 58:779-81, 817-20, 891-6 Ap 9-23 '15
Growing magnitude of freight loss and damage claims. Ry R 56:131-2 Ja 23 '15
Handling of claims for perishable freight, J: F. Boylan, Ry Age 59:416-17 S 3 '15
Injuries to persons. S. S. Bishop, Elec Ry J 46:234-5 Ag 7 '15
Loss and damage committees on the Lehigh valley. Ry Age 59:861 N 5 '15
Loss and damage payments. Ry Age 59:993 N 26 '15

Loss and N 26 '15

N 26 15 Loss and damage prevention, Baltimore & Ohio R. R. Ry R 55:683-4 D 5 '14 Prevention of loss and damage freight claims. G. E. Whitelam, Ry R 57:692-4 N 27 '15 Reducing stock claims. J. L. Coss. Ry Age 59:280 Ag 13 '15

See also Street railroads-Claims

Clearance

Illinois commission fixes railway clearances, plan Elec Ry J 46:228 Ag 7 '15

Illinois commission prescribes minimum clearances. Ry R 56:633-6 My 8 '15; Excerpt. Ry Age 58:940 Ap 30 '15

Track-clearance records. J. G. Wishart. Eng N 73:481-2 Mr 11 '15

#### Construction

Bingham and Garfield railway—a short road in Utah with some unusual features. H. C. Goodrich. il diag maps W Soc E J 20:512-29

Business principles should govern railroad building. J: F. Stevens. Eng Rec 72:381-2 S

25 '15 'Car-transfer ferry on the Ohio; C., B. & Q. R. R. diags plans Eng N 74:599-600 S 23 '15 Completing the Mount Royal tunnel into Montreal. il diags plan Ry Age 59:887-60 N 5 '15 Concrete units for crib construction. M. D. Campbell. il Ry Age 58:476-7 Mr 12 '15 Construction and improvements in 1914. Ry R 56:228-30, 260-2, 291-4 F 13-27 '15 Construction of new line to reach Utah coal fields. il map Ry Age 58:971-3 My 7 '15 Construction of the Hallstead cut-off, D. L. & W. R. R. il diags Ry R 56:111-15, 143-9 Ja 23-30 '15 Construction of the New York connecting

Construction of the New York connecting railroad, il diags map Ry Age 59:421-5 S 3

Data on the design and cost of concrete piles used on railroad work, diags Eng & Contr 43:452-3 My 19 '15 Driving a five-mile tunnel through the Sel-kirks, il diags map Ry Age 57:1082-4 D 11

'14
Economies in construction work, M. E. Carroll, Ry R 56:872-5 Je 26 '15
Elkhorn extension of the Carolina, Clinchfield & Ohio Ry, il Ry R 56:239-42 F '20 '15
Government's Alaskan railway, il map Ry R 57:393-6 S 25 '15
Hell-Gate arch bridge and the New York Connecting railroad, il diag map Ry R 57:453-61 O 9 '15

61 O 9 '15 Important realinement problem on the Pennsylvania. il map Ry Age 59:456-8 S 10 '15 Lake Erie & Eastern R. R. il plan map Ry R 57:132-7 Jl 31 '15 Magnolia cut-off improvement on the Balti-more and Ohio railroad. A. W Thompson. il diags maps Eng Soc W Pa 30:809-933 D '14; Abstract. Rv Age 58:934-8 Ap 30 '15 Modern methods in railway tunnel construc-tion. C: S. Churchill. diags Ry R 57:547-55 O 30 '15

Railroads-Construction -Continued

ailroads—Construction—Continued
New line from Lewistown, Mont., to Great
Falls. il map Ry Age 58:734-9 Ap 2 '15
New line of the Chesapeake & Ohio Northern.
diags map Ry Age 58:1017-18 My 14 '15
Northern Pacific Ry. near Tacoma—new coast
line. il diags map Eng N 73:562-5 Mr 25 '15
Opening of the Mont d'Or tunnel. il map Engineer 119:505-6, 508 My 21 '15
Pennsylvania improvements through Piqua,
Ohio; new station and second track on revised grade, eliminating eight street grade
crossings. il plans Ry Age 58:1003-6 My 14
'15

Piercing the Selkirk mountains for a five-mile tunnel. il map Eng Rec 70:604-6 D 5 '14; Same cond. Eng M 48:760-2 F '15 Plans for the Hetch-Hetchy construction railroad. Eng N 74:925 N 11 '15 Point Defiance line eliminates last heavy grade between Tacoma and Portland. D: L. Soltan. map Eng Rec 71:744-5 Je 12 '15 Progress on Summit cut-off of the Lackawanna. il diags Ry Age 58:235-9 F 5 '15 Railroad built around burning tunnel in three weeks. il Eng Rec 71:797 Je 26 '15 Record-breaking construction projects. Ry Age 58:216 F 5 '15 St. Paul and Oregon-Washington joint terminals in Spokane. il plans Ry Age 58:85-8

Ja 15 '15
Thirty miles of Chesapeake & Ohio Northern
begun. map Eng Rec 72:300-1 S 4 '15
\$21,000,000 South Philadelphia railroad improvement now well under way. il map Eng
Rec 72:327-9 S 11 '15
Using bulk cement on railway construction
work. M. D. Campbell, il Ry Age 58:1441-3
Je 18 '15

See also Bridges, Railroad; Culverts; Curves; Grade crossing elimination; Railroad engineering; Railroad ties; Railroads—Buildings and structures; Railroads—Crossings; Railroads—Curves; Railroads—Earthwork; Railroads—Electrification; Railroads—Track; Rails; Trestles; Tunnels and tunneling.

# Construction statistics

See Railroads-United States

## Cost of operation

Calculations showing economy of constructing the Rogers Pass tunnel. J. G. Sullivan. diags Eng & Contr 44:398-400 N 17 '15 Cost of stopping and starting trains. F. W. Green. Ry R 56:655-7 My 15 '15

## Crossings

Cobb shockless railroad crossing il Ry Age 58:1085-6 My 21 '15 Continuous rail crossing, il Ry Age 59:528-9 S

Crossing of a narrow gage and a standard gage track, T. C. Herbert, il diag Ry Age 57:1150 D 18 '14
Experimental concrete slab grade crossing.
M. D. Campbell, il Ry Age 59:129 Jl 16 '15
Portable track crossings in a contractor's yard, il Eng N 74:317 Ag 12 '15
Shockless railroad crossing, il diags Elec Ry J 45:994-6 My 22 '15
Shockless railroad crossing. E. S. Cobb. il Munic Eng 48:362-3 Je '15
Three-level railway crossing at Chicago, il diags plans Eng N 73:708-10 Ap 15 '15
Two years' maintenance record of track crossing on a steel substructure, il diags Elec Ry J 45:68 Ja 2 '15

See also Grade crossing elimination:

See also See also Grade crossing eli Grade crossings; Railroads—Track elimination:

### Curves and turnouts

Advantage and cost of spiraling curves. W. F. Rench. Ry Age 59:765-6 O 22 '15
Graphical method of string-lining curves. H. M. Church. Ry Age 59:130 Jl 16 '15
Lateral stresses on rails in curved tracks. G: L. Fowler il Ry Age 59:319-22 Ag 20 '15 Retracing old compound railway curves. F. W. Green. Eng N 74:364 Ag 19 '15

Three-centered connecting tracks between tangents and curves. S. E. Shoup, Eng N 73: 446-8 Mr 4 '15

Two ways of laying out a compound curve. S. Striezheff. Elec Ry J 45:426 F 27 '15

## Damages from floods, etc.

Effect of recent floods on railways. il Ry Age 59:729-32 O 22 '15

## Development work

Development Work

Development of Long Island, H. B. Fullerton.
Ry Age 57:1040-1 D 4 '14

Getting city people back to the country. F. H.
La Baume. Ry Age 57:1057 D 4 '14

Nineteen years' development work on the
Santa Fe. Ry Age 58:1465-8 Je 25 '15

Railway development association semi-annual
meeting, New York, Nov. 9-11. Ry Age 59:
909-12, 938-9 N 12-19 '15

#### Earthwork

Building low-grade line for Norfolk & West-ern R. R. il map Eng N 74:818-21 O 28 '15 Calculating cross section areas on railroad valuation work. F. T. Morse, Ry Age 59:29

J1 2 '15
Consolidation of earthwork during construction. Ry R 56:533-4 Ap 17 '15
Construction of the Hallstead cut-off, D. L. & W. R. R. il diags Ry R 56:113-15 Ja 23 '15
Method of obtaining volumes in railroad or ditch work. F. C. Snow. Eng & Contr 43:304
Mr 31 '15
Railroad subgrade troubles—preventives and cures. J. T. Bowser. Eng Rec 72:203-4 Ag 14 '15

Sce also Railroads-Grades

## Electric equipment

Electric equipment
Association of railway electrical engineers 8th annual convention, Chicago, Oct. 19-22. Ry R 57:529-30 O 23 '15
Recent improvements in the electric lighting of steam railroad cars. R. C. Lanphier, il diags Am Inst E E Pro 34:1829-46 Ag '15
Underframe axle lighting equipment, il diags Ry R 56:568-70 Ap 24 '15; Ry Age (Mech ed) 89:257-8 My '15
Underground cable on the Pennsylvania railroad. I. C. Forshee, il Ry Age 59:269-71 Ag 13 '15

## Electrification

Electrification

Adding electric power to a railroad between the Broad street station and the West Philadelphia yards. Sci Am 113:95 Jl 31 '15

Australian railways to be electrified. Elec Ry J 46:1037 N 20 '15

Butte, Anaconda & Pacific railway contact system. J. B. Cox. il diags map Am Inst E E Pro 34:1447-76 Ag '15; Same. Gen Elec R 18:842-59 Ag '15; Abstract. Elec Ry J 46:59-60 Jl 10 '15

Butte, Anaconda & Pacific railway electrical

tute, Anaconda & Pacific railway electrical operation, J. B. Cox, il maps Am Inst E E Pro 33:1729-53 N '14; Same. Gen Elec R 17: 1047-65 N '14; Abstract. Elec Ry J 44:1050-1 N 7 '14; Abstract. Ry Age 57:1193-5 D 25 '14; Abstract. Eng & Min J 99:529-30 Mr 20 '15; Discussion. Am Inst E E Pro 34:134-43 Ja

'15
Canadian Northern tunnel and terminal electrification. W. C: Lancaster. il diags maps Gen Elec R 17:1066-75 N '14; Same. Ry R 55:710-15 D 12 '14
C., M. & St. Paul—electrification of 440.5 miles. il map Ry Age 59:683-9 O 15 '15
C., M. & St. P.—electrification of the Puget Sound lines. A. H. Armstrong. il diags maps Gen Elec R 18:5-9 Ja '15; Same. Ry Age 57: 1125-6 D 18 '14; Same. Elec R & W Elec'n 65:1205-8 D 26 '14; Same. Ry R 56:96-100 Ja 16 '15

65:1203-6 D of 16 '15 C., M. & St. P. electrification progresses rapidly. Eng N 74:862 O 28 '15 Chicago, Milwaukee & St. Paul—great railway electrification project. il map Sci Am S 79: 56-8 Ja 23 '15

C., M. & St. P.—operating plans for the electrified division, il Elec Ry J 44:1341-2 D 19 14

Chicago, Milwaukee & St. Paul Ry.—electraction. diag map Eng N 73:22-3 Ja 7

Chicago, Milwaukee and St. Paul railway elec-trification. diags map Engineer 119:104-6 Ja 29 '15

Railroads-Electrification Continucă

Great Falls terminal, il Elec R & W Elec'n Great Falls terminal, il Elec Ry J 45:1172-3 Je 19 '15 C., M. & St. P. railway; electrification of Great Falls terminal, il Elec R & W Elec'n 66:1167-8 Je 19 '15

C., M. & St. P. railway; electrification of Great Falls terminal. il Elec R & W Elec'n 66:1187-8 Je 19'15
Chicago, Milwaukee & St. Paul Ry.—electrification of terminal line at Great Falls, Mont. il Ry R 57:57-8 Jl 10'15
Chicago, Milwaukee & St. Paul railway; 1500-volt electrification. W. D. Bearce. il Gen Elec R 18:644-5 Jl '15
C., M. & St. P. railway—Great Falls terminal line now electrically operated. il Eng Rec 71:767 Je 19'15
C., M. & St. P. railway—Great Falls terminal line now electrically operated. il Eng Rec 71:767 Je 19'15
C., M. & St. P. railway high-voltage direct-current system. Elec W 64:1186 D 19'14
Chicago, Milwaukee & St. Paul railway—progress on the electrification. il Elec R & W Elec'n 67:769-71 O 23'15; Elec Ry J 46:794-8 O 16'15; Eng Rec 72:518 O 23'15; Ry R 57:556-8 O 30'15; Power 42:645-6 N 9'15
Chicago, Milwaukee & St. Paul Ry.—3000-volt direct-current electrification of the Puget Sound lines. Power 41:72 Ja 12'15
C. M. & St. P. Ry.—transmission system of the electrified divisions. R. E. Wade. il Ry R 57:203-5 Ag 14'15
Conditions affecting the success of main line electrification. W. S. Murray. il Am Inst E E Pro 34:1873-1913 Ag '15; Same cond. Elec Ry J 45:229-31 Ja 30'15; Same cond. Elec Ry J 45:229-31 Ja 30'15; Same cond. Elec Ry J 45:229-31 Ja 30'15; Same cond. Ry Age 58: 923-8 Ap 30'15: Discussion. Am Inst E Pro 34:1913-32 Ag '15; Same. J Fr Inst 180: 75-99 Jl '15
Conservatism in railroad electrification. W. S. Murray. Eng Rec 71:178-9 F 6'15
Construction, maintenance and cost of over-

Conservatism in railroad electrification. W. S. Murray. Eng Rec 71:178-9 F 6 '15 Construction, maintenance and cost of overhead contact systems; catenary construction. F. Zogbaum. Am Inst E E Pro 34:1267-81 Je '15; Abstract. Elec Ry J 46:56-7 J1 Contact roil in the 
Contact rail installation in England, il diag Elec Ry J 46:154-6 Jl 24 '15 Electric motive power in the operation of railroads. W: Hood. Ry Age 59:603-4 O 1

lectric motive power in the operation of railroads; abstracts, E. H. McHenry, Elec Ry J 46:623 S 25 '15; Ry Age 59:602-3 O 1 '15

Zibertrical night at N. Y. R. R. club. Elec Ry J 45:624-5 Mr 27 '15 Electrification discussed at meeting of Western society of engineers. Elec Ry J 45:579-81 Mr 20 '15 Electrification of American railways. R. Gordon. il Eng M 49:34-42 Ap '15 Electrification of main-line railroads; abstract. B. F. Woods. Elec W 65:1518 Je 12 '15 Electrification of steam railways. Ry R 56: 407-8 Mr 20 '15 Electrifying steam railroads. Sci Am 112:558 Je 5 '15 Inertia effect of moving electric trains. I. Modern

Je 5 16 Inertia effect of moving electric trains. J. Mc-Annix. Elec Ry J 45:714-15 Ap 10 '15 Jamestown, Westfield & Northwestern rail-road electrification. il map Elec Ry J 45:

Jamestown, Westfield & Northwestern railroad electrification. il map Elec Ry J 45: 1110-11 Je 12 '15
London & Port Stanley railroad electrification. map Elec Ry J 44:1387-8 D 26 '14
London and Southwestern railway electrification. il diags Engineer 120:289-91, 310-13, 342, 246-9 S 24-0 8 '15
London & South-western railway suburban electrification. il Elec Ry J 46:225 Ag 7 '15
Mountain railway electrification. F. Castiglioni. Elec Ry J 46:858-60 O 23 '15
New departure in the electrification of steam railways. Eng N 73:595-6 Mr 25 '15
New electrification work on London suburban railroads. Elec R & W Elec'n 67:852-4 N 6 '15
Nortolk & Western electrification. il plans map Elec Ry J 45:1058-69 Je 5 '15
Norfolk & Western electrification. il Power 41: 830-5 Je 22 '15
Norfolk & Western Elkhorn grade electrification. il diags map Ry Age 58:1153-63 Je 4 '15
Norfolk & Western—new field for railway electrification developed. il Eng Rec 71:704-6

Norfolk & Western single-phase electrification. il Elec W 65:1456-9 Je 5 '15 Norfolk & Western railway—electric traction.

il diag plans Eng N 73:1192-5, 1238-43 Je 17-24 '15

17-24 '15

Norfolk & Western railway electrification. Engineer 120:57 Jl 16 '15

Norfolk & Western Ry.—electrification of the Elkhorn grade. il diags Ry R 56:756-61, 791-7; 57:101-7, 150-2 Je 5-12, Jl 24-31 '15

Norfolk & Western railway; electrification of the Elkhorn grade. il Sci Am S 79:372-4 Je 12 '15

12 '15
Ontario municipal railway—1500-volt directcurrent electrification. G. H. Hill. Gen Elec
R 18:10-11 Ja '15
Operating results of the electrification of
steam railroads; with discussion. G: Gibbs,
E. B. Katte, W: S. Murray and C. A. Goodnow. W Soc E J 20:308-38 Ap '15; Abstract.
Am Soc M E J 37:357 Je '15
Overhead construction in the PhiladelphiaPaoli electrification. il Elec Ry J 45:1118 Je

Overhead contact systems, construction and costs. E. J. Amberg. pls Am Inst E. E. Pro 34:1255-66 Je '15; Abstract. Elec Ry J 46:56 Jl 10 '15

J1 10 '15
Passing of the steam locomotive. C: B. Brewer. il Sci Am 113:488-9 D 4 '15
Paths of progress. Gen Elec R 18:3-4 Ja '15
Pennsylvania inaugurates electric service in
Philadelphia. il diag Eng.Rec 72:590-3 N 13

Pennsylvania railroad electrification at Philadelphia. il Elec R & W Elec'n 67:923-8 N 20

Pennsylvania railroad electrification at Philadelphia, il map Ry Age 59:880-94 N 12 '15
Pennsylvania railroad electrification at Philadelphia, il plan Elec W 66:1074-6 N 13 '15
Pennsylvania railroad—electrification of suburban line at Philadelphia, il Ry R 57:37-40, 611-19 JI 10, N 13 '15
Pennsylvania railroad electrifies Philadelphia district, il map Eng N 74:930-3 N 11 '15
Pennsylvania railroad—electrifying the Philadelphia-Paoli division, il Sci Am 113:444 N 20 '15

20 '15
Philadelphia-Paoli electrification, il diags Elec
Rv J 46:980-9 N 13 '15
Power distribution on Pennsylvania R. R. at
Philadelphia, il plan Power 42:685-6 N 16 '15
Progress in railway electrification in 1914.
N. W. Storer. Ry Age 58:12 Ja 1 '15
Radiator-type transformers for the New
Haven system, il diags Elec W 65:491-3 F
20 '15

Haven System. It mags Elect W 63.431-3 F 20 '15 Railway electrification at Sydney, Australia. Elec R & W Elec'n 67:902 N 13 '15 Railway electrification—possibilities and pre-cautions. W. S. Murray. Eng Rec 71:394 Mr

Results of Italian three-phase electrifications. G. Pontecorvo. il Elec Ry J 45:450-4 Mr 6

Review of electric railways. W. B. Potter and G. H. Hill. il Gen Elec R 18:444-53 Je '15 Running railroads by water power. T: F. Logan. il Sci Am 112:603+ Je 19 '15 St. Clair tunnel electrification operating data. Elec Ry J 46:1084-5 N 27 '15 Silesian single-phase electrification. diags map Elec Ry J 45:666-7 Ap 3 '15 Southern Pacific company Portland division contact system. P. Lebenbaum. il diags map Am Inst E E Pro 34:1295-1308 Je '15; Abstract, Elec Ry J 46:57-8 Jl 10 '15 Symposium on operating results of steamrailroad electrifications. Elec R & W Elec'n 66:540-1 Mr 20 '15

Three thousand-volt direct-current electric locomotives for the Chicago, Milwaukee & St. Paul railway. il Sci Am 113:391+ N 6 '15

Training steam railroad men for electric operation. C. Roberts. il diag Elec Ry J 45: 970-2 My 22'15

Vienna-Pressburg electrification. E. fehlner. Elec Ry J 46:593 S 18 '15

West Jersey and seashore railroad; third rail and trolley system. J. V. B. Duer, il diags Am Inst E E Pro 34:1237-53 Je '15

See also Electric locomotives;

Railroads -- Continued

Employees

Employees

Address to apprentices. G: M. Basford. Ry
Age (Mech ed) 89:185-6 Ap '15
Answer to "A clerk's plea." K. Lean. Ry Age
59:682 0 15 '15
Answer to "A clerk's plea." L. E. Riley. Ry
Age 59:1000 N 26 '15
Ars you making friends for your railroad?
R. V. Wright. Ry Age 58:129-31 Ja 22 '15
Clerk's plea. Ry Age 59:459-60 S 10 '15
Commission on industrial relations sits in
Washington. Ry R 56:616-18 My 8 '15
Difficulties in increasing the scope of the section foreman's duties. J. P. Costello. Ry
Age 58:1449-50 Je 18 '15
Efficiency and discipline systems. E. J. Devans. Ry R 57:409-10 S 25 '15
Helping the apprentice. H. E. Blackburn. Ry
Age (Mech ed) 89:582-3 N '15
How can you help the apprentice? prize letter and others received in the competition. Ry
Age (Mech ed) 89:531-2 O '15
Industrial commission inquires into railroad employment. Ry R 56:488-9 Ap 10 '15
Industrial mediation and conciliation. J. Krutt-schnitt. Ry R 56:636-7 My 8 '15; Excerpts.
Ry Age 58:125-7 My 28 '15
Is the railroad Y. M. C. A. really worth while?
Ry Age 58:295-6, 358-60 F 19-26 '15
Italian-English course of the Pennsylvania railroad. il Ry Age 59:354-5 Ag 20 '15
McComb apprenticeship plan, Illinois Central railroad. H. N. Seney. Ry R 57:619-20 N 13
'15
Making of good car inspectors. A. M. Orr;

Making of good car inspectors, A. M. Orr; "E. C." Ry Age (Mech ed) \$9:575-8 N '15 Mr. Rijley and the Santa Fe family, Ry R 57:584-5 N 6 '15; Abstract, Ry Age 59:851 N

5. 15. Physical examinations of section foremen. W. E. Schott. Ry Age 57:1147 D 18 '14 Plan for improving the position of railway clerks. Ry Age 59:887 N 12 '15 Present welfare work of French railroads. W. S. Hiatt. Ry Age 59:60 J1 9 '15 Productive efficiency and wages. Ry Age 58: 118-19 Ja 22 '15 Public regulation of wages of railway employees. F. H. Dixon. Ry Age 58:929-32 Ap 30 '15

Qualifications of a terminal superintendent, S. W. Roberts. Ry Age 59:434-5 S 3 '15 Relations of the section foreman and the public. J. T. Bowser; W. E. Schott. Ry Age 58:331-2 F 19 '15

58:331-2 F 19 '15 Section foremen's debating society on the C. M. & St. P. Ry. W. H. Kofmehl. Ry R 56:665 My 15 '15 Southern Pacific employees given prizes for solicitation of traffic. Ry Age 58:1046 My 21 '15

Start the apprentice right. Ry Age (Mech ed) \$9:585-6 N '15
Steady employment for section men, on the Long Island R. R. C. King. Ry R 56:539-40 Ap 17 '15
Testimony in the western wage arbitration. Ry R 56:156-7 Ja 30 '15
Track labor problem. E. T. Howson. Ry Age 59:522-4 S 17 '15
Track maintenance. K. L. Van Auken. Ry R 57:526-9, 660-3 O 23, N 20 '15
Training of railway employees. D. C. Buell. Ry Age 59:454-5 S 10 '15

Training of young men with reference to promotion. G: M. Basford. Ry Age 59:150-3 Jl

Unemployment on railroads. Ry Age 58:214-15 5 '15

Unemployment resulting from railroad depression. Ry Age 58:31-2 Ja 1 '15

United States board of mediation and concilia-tion annual report. Ry Age 58:192-4 Ja 29 '15 Unnoticed unorganized employees. H. Pigeon. Ry Age 59:416 S 3 '15

War test of French politeness. W. S. Hiatt. Ry Age 59:278 Ag 13 '15

Welfare work at Pitcairn, Pa., freight transfer. Ry Age 59:609-10 O 1

Why cost of operation has decreased on the Frisco. F. D. Wrightsman. Ry Age 58:1464 hy co. F. Frisco. F. 15

See also Locomotive engineers; Locomotive firemen; Railroads—Freight agents; Railroads—Station agents; Train dispatchers

Equipment and supplies

Accounting for rail and ties. C; E. Parks. Ry Age 58:470 Mr 12 '15 Economy in the use of track material. J. T. Bowser Ry R 57:229 Ag 21 '15 Fighting caterpillars with steam. il Sci Am 112:104 Ja 30 '15

112:104 Ja 30 '15
First principles of economy; handling railroad scrap. Ry R 56:448-5 Mr 27 '15
Foreign specifications for railway material. J Fr lnst 180:615-16 N '15
Freight car stenciling outfit. H. F. Blossom. diag Ry Age (Mech ed) 89:458 S '15
General stores department. H. C. Stevens. Ry Age 58:835 Ap 16 '15
Handling of new and scrap maintenance materials; prize winning and other papers. Ry Age 57:339-44, 531-6; 58:320-4 Ag 21, S 18 '14, F 19 '15
Income from the maintenance of way department. Ry Age 58:1071 My 21 '15
Locomotive and train supplies on the Frisco. il Ry Age 58:697-9 Mr 26 '15
Master blacksmiths' convention; discussion of reclaiming scrap. Ry Age (Mech ed) 89:473 S

reclaiming scrap. Ry Age (Mech ed) 89:473 S

Mechanical, purchasing and stores departments. H. C. Pearce. Ry Age 58:1249-50 Je

Modern reclamation plant and scrap yard. Ry R 57:281-4 Ag 28 '15

R 57:281-4 Ag 28 '15 Organizing the supply department on the Sea-board air line. H. C. Pearce. Ry Age 58: board air li 45-7 Ja 8 '15

Pennsylvania railroad test department. C. D. Young. il plan Ry Age (Mech ed) 89:332-7 Jl '15; Same. Ry Age 59:6-11 Jl 2 '15; Same. Ry Ry 57:2-5, 42-6, 117-18 Jl 3-10, 24 '15

Plant for handling scrap on the Boston & Albany, if diags Ry Age 58:745-6 Ap 2 '15 Precedent versus progress in the stores department. G: G. Yeomans. Ry Age 59:237-8

Railroading from a general storekeeper's point of view. J. G. Stuart. Ry R 57:700-2 N 27 '15 Railway storekeepers' association 12th annual convention. Ry Age 58:1039-46, 1125-6 My 21-

Railway storekeepers' association 12th annual convention. Ry R 56:688-93 My 22 '15

Railway storekeepers' convention. Ry Age (Mech ed) 89:285-90 Je '15

Railways and the manufacture of equipment. Ry Age 59:222-3 Ag 6 '15

Reclamation of material: report of committee of Railway storekeepers' association. Ry Age (Mech ed) 89:317-18 Je '15

Reclamation of scrap on the Great Northern, il Ry Age 58:967-70 My 7 '15; Same, Ry Age (Mech ed) 89:305-8 Je '15

Scrap-handling plant of Boston & A road, il Eng Rec 70:651-2 D 12 '14 Albany rail-

Signal and supply departments. C. R. Ahrens; R. D. Long; A. G. Shaver. Ry R 57:120-4 Jl 24 '15

Why throw away what we need, Ry R 55;770-1 D 26 '14

See also Air brakes; Brakes; Car. couplings; Cars; Freight cars; Locomotives; Railroad supplies industry; Railroad ties; Railroads—Electric equipment; Railroads—Electrication; Railroads—Maintenance and repair; Railroads—Management; Railroads—Safety devices and measures; Railroads—Sanitation; Railroads—Shops; Railroads—Signals; Railroads—Tools and implements; Rails; Track scales Track scales

## Equipment trusts

ankers and equipment trust certificates. Ry Age 58:53-4 Ja 8 '15 Bankers

Security of equipment trust certificates. Ry Age 58:43 Ja 8 '15

Railroads Continued

#### Exhibitions

Railway exhibit at the Panama-Pacific international exposition at San Francisco, Cal. il plan Ry R 56:685-8, 719-21, 765-8, 811-12, 882-5 My 22-Je 12, 26 '15 Railways and the California expositions. il Ry Age 59:499-502 S 17 '15 Transportation exhibits at the Panama exposition. W: S. Wollner. Ry Age 58:373-5 F 26 '15

#### Fares

Fares

Campaign for advances in passenger rates. Ry Age 58:255-6 F 12 '15

Campaign for increased passenger fares. Ry R 56:191-3 F 6 '15

"Campaign of candor" for higher passenger fares. Ry Age 58:259-60 F 12 '15

Case for higher passenger fares in the West. Ry R 57:51-3, 89-90 J1 10-17 '15

Former railroad commissioner's views on passenger fares. C. V. McAdams. Ry Age 58: 102-3 Ja 15 '15

Hearing on advances in western passenger

102-3 Ja 15 '15
Hearing on advances in western passenger fares. Ry Age 59:55-7, 93-6, 153-4 Jl 9-23 '15
Lower passenger fares and higher freight rates, Ry Age 59:181-6 Jl 30 '15
Passenger fare question in Ohio, L. E. Johnson, Ry Age 58:747-8 Ap 2 '15
Supreme court decisions in two state rate cases, Ry Age 58:632-3 Mr 19 '15

#### Fences

Cost of fence wire, wood and steel posts. Eng N 74:362 Ag 19 '15 4½ miles of concrete fence flank transit route on Sea beach line improvement in Brooklyn. il Eng Rec 72:68 Jl 17 '15 Specifications for standard right-of-way fences: report of A. R. E. A. committee. Ry R 56: 387-90 Mr 20 '15

#### Finance

Annual reports of railroads. See weekly numbers of Railway age gazette
Annual reports of the Chesapeake and Ohio, Hocking valley and Chicago. Milwaukee & St. Paul railways. Ry Age 59:624-30 O 1 '15
Aspects of the financial problem of the railways; effect which the Federal reserve act will have on needs of railways for new capital. H. P. Willis. Ry Age 58:999-1002 My 14
'15; Excerpts. Ry R 56:734-7 My 29 '15
Buffalo, Rochester & Pittsburgh railway company's 30th annual report. map Ry Age 59:310-11, 370-2 Ag 20 '15
Canadian Pacific railway 34th annual report. map Ry Age 59:377-8, 410-12 Ag 27 '15
Chicago, Rock Island & Pacific—1902 to 1915. Ry Age 58:774-6 Ap 9 '15
Chicago, Rock Island & Pacific receivership. Ry Age 58:890 Ap 23 '15
Chief engineers discuss grade-crossing law and cost distribution. Eng Rec 71:455-6 Ap 10 '15
Conservatism in railroad electrification. W. S. Murray. Eng Rec 71:178-9 F 6 '15
Division of railway income between capital and labor. W. A. Worthington. Ry Age 59: 268 Ag 13 '15
Effect of recent legislation and other conditions as reflected in the operation of the Delaware & Hudson co. L. F. Loree. il plan Ry R 56:588-91 My 1 '15
Grade-crossing law and its effect on grade-crossing elimination. C. W. Stark. Eng Rec 71:327-9 Mr 13 '15
Hearings on western freight rate advances. Ry Age 58:435-43 Mr 12 '15
Interstate commerce commission's report on the Rock Island. Ry Age 59:232-7 Ag 20 '15

Interstate commerce commission's report on the Rock Island, Ry Age 59:323-7 Ag 20 '15 Investigation of the Rock Island system. Ry R 56:321-2 Mr 6 '15

Lehigh Valley railroad annual report for the fiscal year ended June 30, 1915. Ry Age 59: 266-7, 303-6 Ag 13 '15

Louisville & Nashville investigation. Ry Age 58;413-14 Mr 5 '15

Maximums and minimums in train operation. A. Price. Ry R 56:286-9 F 27 '15; Same. Ry Age 58:401-3 Mr 5 '15

Michigan Central and the Big Four. map Ry Age 58:731-3 Ap 2 '15

Necessity for additional revenues on western revenues on western railways; brief submitted by C. C. Wright in western rate advance case. Ry Age 58: 1415-18 Je 18 '15

in western rate advance case. Ry Age 58: 1415-18 Je 18 '15

New England railroad situation. Ry Age 58: 729-31 Ap 2 '15

Nineteen years' development work on the Santa Fe. map Ry Age 58:1403-6 Je 18 '15

Norfolk & Western. map Ry Age 59:491-2 S

Operating results of Canadian railways in 1914. J. L. Payne. Ry Age 58:687-9 Mr 26 '15 Operation of the Long Island railroad in 1914. map Ry Age 58:814-16 Ap 16 '15 Ownership of railway stock. Ry Age 59:186 Jl

Parcel post and its effects on railway revenues; abstracts. V. J. Bradley. Ry Age 57: 1046 D 4 '14; Eng M 48:593-6 Ja '15 Pennsylvania railroad. map Ry Age 58:394-6 Mr 5 '15

Property costs as a factor in rate making. Ry R 57:277-9 Ag 28 '15 Railroad bankruptcy. Ry Age 59:632-4, 676-8,

Railroad's maintenance expenses allocated between freight and passenger service. Eng Rec 72:226-9 Ag 21 '15

Railway insolvencies in 1914. Ry R 56:13 Ja 2

'15
Railway revenues for the fiscal year, ending June 30, 1915. Ry Age 59:574 S 24 '15
Receiverships and foreclosure sales. Ry Age 58:4-6 Ja 1 '15
Recent development in railroad finance. G: A. Clark. Ry Age 58:1418-20 Je 18 '15
Reorganizations and railroad bonds. J: E. Blunt, jr. Ry R 57:633-4 N 13 '15
Revenues and expenses for the fiscal year, 1915. S. Thompson. Ry R 57:266-7 Ag 28 '15
Revenues and expenses of railways, fiscal year ending June 30, 1915. Ry Age 59:359-60 Ag 20 '15

Revenues and expenses of railways: four months of fiscal year ending June 30, 1915. Ry Age 57:1099-1100 D 11 '14 Revenues and expenses of railways; monthly statistics published in the Railway age gazette

Rock Island financing. Ry R 57:243-9 Ag 21

Rock Is Island receivership, Ry R 56:567-8 Ap

24 '15
St. Louis & San Francisco: comparison between the 1914 and 1913 fiscal years. Ry Age 58:119-21 Ja 22 '15
Summary of revenues and expenses of large steam roads. Ry Age 58:277 F 12 '15
Trend of railway earnings in the year 1914. F. H. Dixon. Ry Age 58:21-2 Ja 1 '15
Wabash-Pittsburg terminal reorganization plan. map Ry Age 59:146-7 Jl 23 '15
Wabash reorganization plan. Ry Age 58:978
My 7 '15
War and pending railway finance G: A

Ary and pending railway finance. G: A. Clark. Ry Age 58:223-4 F 5 '15 'hy a railroad should pay a dividend. I. L. Lee. Ry Age 58:33 Ja 1 '15 War

Why a

See also Railroads—Equipment trusts; Railroads—Rates; Railroads—Securities; Railroads—Valuation

## Fire protection

Fire fighting on the Pennsylvania system. Ry R 57:559 O 30 '15
Fire hazards at coaling stations. Ry Age (Mech ed) 89:562 N '15
Railway fire protection association 2d annual meeting. Ry Age 59:691-4 O 15 '15

## Freight

Accuracy of grain weights, F. C. Maegly, Ry Age 58:888-9 Ap 23 '15

A. R. A. report on freight efficiency. Ry Age 58:1127-8 My 28 '15

Careful loading of package freight, il Ry Age 58:965-6 My 7 '15

Classification of freight loss and damage payments. Ry Age 59:90-1 Jl 16 '15

Cooling hogs in transit. diags Ry Age 58:752 Ap 2 '15

Effective freight ffective freight claim preventive crusad Ry Age 58:779-81, 817-20, 891-6 Ap 9-23 '15 Railroads Freight Continued

Railroads Freight Continued
Growing magnitude of freight loss and damage claims. By R 56:131-2 Ja 23 '15
Hunting stray freight on the Pennsylvania. Ry
Age 3:162 3 J1 23 '15
Provention of loss and damage freight claims.
G. E. Whitelam Ry R 5:1932 I N 27 '15
Report of committee on relations between
introde IV Age 3:1013 In N 26 '15
Simula method of checking L. C. L. freight.
RJ Age 3:13 J II 9 '15
Weighing of less than carload freight. E. A.
O'Donnell. Ry Age 5:11197-8 D 25 '14
Where the delivering agent falls down. D. C.
Davis. Ry Age 58:966 My 7 '15
See also Freight car service: Freight cars

See also Freight car service; Freight cars; Freight handling; Railroads—Rates; Rail-road Tounlind Railroads Train loss

## Freight agents

What the commercial agent can do for the product of 
## Frogs

See Railroads-Switches and frogs

#### Fuel

Fuel department—a constructive criticism.

I act to the G A C THE TYPE IN THE TRY
Age 58:195-7 Ja 29 '15

Fuel oil on railroads. Sci Am S 79:203 Mr 27

International railway fuel association 7th annual convention, Ry Age 58:1054-61 My 21 '15 International railway fuel association 7th annual convention, Ry R 56:696-703 My 22 '15

Gaging track between rail flanges. E. Keough, il Ry Age 57:1150 D 18 '14

See also Railroads, Narrow gage

## Government ownership

See Railroads and state

#### Grades

Grade reduction on the Kentucky division of the Illinois Central R. R. F. G. Water, jr. il Ry R 57:389-93 S 25 '15 Superheater locomotives and grade revision. P. M. La Bach. Ry Age 59:469-71 S 10 '15

## ice supply

Design of railroad ice storage houses. Eng & Contr 42:563-5 D 16 '14; Abstract, Ry Age 57: 759-60 O 23 '14

40,000-ton railroad icehouse electrically opera-ted, plans Eng Rec 72:132 Jl 31 '15

## Labor

## Laboratories

Pennsylvania railroad test department. C. D. Young. il plan Ry Age (Mech ed) 89:332-7 Jl '15; Same. Ry Age 59:6-11 Jl 2 '15; Same. Ry R 57:2-5, 42-6, 117-18 Jl 3-10, 24 '15; Excerpts. Metal Ind n s 13:288-9 Jl '15

## Law

See Railroad law

#### Location

Economics of railway location: report of A. R. E. A. committee. Ry R 56:391-3 Mr 20 '15; Same. Eng Rec 71:370-2 Mr 20 '15

## Maintenance and repair

Maintenance and repair
Difficulties in increasing the scope of the section foreman's duties, J. P. Costello. Ry
Age 58:1449-50 Je 18 '15
Economical handling of maintenance of way
painting. Ry Age 57:1134 D 18 '14
Handling of new and scrap maintenance materials; prize winning and other papers. Ry
Age 57:339-44, 531-6; 58:320-4 Ag 21, S 18
'14 F 19 '15

Age 57:339-4'14, F 19'15

Increasing the scope of the section foreman's duties. E. R. Lewis. Ry Age 58:463-4 Mr

Maintenance of way master painters' 12th annual convention. Ry Age 59:968-9 N 19 '15 One effect of retrenchment in maintenance of way expenditures. Ry Age 58:175-6 Ja 29

Promoting the growth of vegetation on the slopes, W. F. Rench, Ry Age 58:471-2 Mr 12

Railway economics. W. A. Smith. Ry R 56:84-

Railway economics, W. A. Smith. Ry R 56:84-5 Ja 16 '15
Safety hints to section foremen. A. W. Ross.
Ry R 56:247-8 F 20 '15
Tool equipment for maintenance of way
forces. Ry Age 59:337-41 Ag 20 '15

\*\*\*star also Car. Repair: Freight cars—Repair: Locomotives—Repair: Railroad ties; Railroads
—Construction; Railroads—Equipment and
supplies; Railroads—Maintenance of way
department; Railroads—Management; Railtonel. Theret. Inflored. Track inspection;
Railroads—Work trains; Rails

## Maintenance of way department

Income from the maintenance of way department. Ity Age 58:1071 My 21 '15
Suggestions for a book of rules for the maintenance of way department, embodying the safety first idea. J. T. Bowser. Ry Age 58: 468-9 Mr 12 '15

## Management

Adversity and office rent. Ry R 56:18 Ja 2 '15 American association of railroad superintend-ents 28th annual convention. Ry Age 59:379-

Car department correspondence and reports. C: Claudy, Ry Age (Mech ed) 89:72 F '15 Car distributer, J. L. Coss. Ry Age 59:159 J1

Censorship of railway messages. W. W. Hall. Ry Age 58:1479 Je 25 '15

Construction, maintenance and cost of overhead contact systems; catenary construction, F. Zogbaum. Am Inst E E Pro 34:1267-81 Je

Engine house organization, W. P. Ry Age (Mech ed) 89:135-6 Mr '15 Fuel department—a constructive criticism.

General manager's supervision over division performance, Ry Age 58:360-1 F 26 '15 Handling of local or way-freight trains. R. R. Farmer. Ry Age 57:1117 D 18 '14 How railway earnings should be increased; a shipper's view. P. W. Coyle. Ry Age 58:13 Ja 1 '15

Ja 1 '15 How the operation of one terminal was im-proved. G. D. Brooke. Ry Age 58:1121-4 My

Increasing the scope of the section foreman's duties. E. R. Lewis. Ry Age 58:463-4 Mr 12

Mechanical, purchasing and stores depart-ments. H. C. Pearce. Ry Age 58:1249-50 Je

Mechanical side of railroading. W: Schlafge. Ry R 56:474-6 Ap 3 '15; Same. Ry Age (Mech ed) 89:283-4 Je '15 Nineteen years' development work on the Santa Fe. map Ry Age 58:1403-6, 1465-8 Je 18-25 '15

Organization for emergencies. Ry Age 58:142

Organization for emergeneres. Ry Age 58:142
Organization for track maintenance from a committee report to the Roadmasters' and maintenance of way association. Ry R 56: 221-4 F 13 '15
Organization in the maintenance of way department. Ry Age 58:834 Ap 16 '15
Organizing the supply department on the Seaboard air line. H. C. Fearce. Ry Age 58: 45-7.18 S '15
Pertinent advice to the railroad superintendent. Ry R 55:771 1) 26 '11
Railroad accounting officer. H. W. Davies. Ry Age 58:1112 My 28 '15
Reclamation of material: report of committee of Railway storekeepers' association. Ry Age (Mech ed) 89:317-18 Je '15
Suggested organization for track maintenance. G. C. Crites. Ry Age 57:1148 D 18 '14
Superintendent—past, present and future. E. H. DeGroot, fr. Ry R 55:359-60 S 19 '14; Same. Ry Age 58:181-2 Ja 29 '15

Railroads—Management—Continued
Terminal proposition. R. M. Baker. Ry Age
59:191-2 Jl 30 '15
Trainmaster and the engine-house foreman.
J. L. Coss. Ry Age 58:960-1 My 7 '15
Value of neatness, il Ry Age 58:467-8 Mr 12

Vice-president in charge of labor. J. L. White. Ry Age 58:997-8 My 14 '15 Wanted—directors who will direct. Ry Age 58:

814 Ap 16 '15

Sce also Freight car service; Freight hand-ling; Locomotives; Railroads—Claims; Railroads—Development work; Railroads—Employees; Railroads—Equipment and supplies; Railroads—Frailroads—Maintenance and repair; Railroads—Maintenance of way department; Railroads—Public relations; Railroads—Rates; Railroads—Records; Railroads—Safety devices and measures; Railroads—Signals; Railroads—Work trains; Railroads—Yards; Train dispatching; Wireless telegraph for railroads

#### Officials

Necrology, 1914. Ry R 56:42-4 Ja 2 '15 Public influence of the railroad superintendent. W: Sproule. Ry R 57:422-3 O 2 '15

## Operation

See Railroads-Management

## Organization

See Railroads-Management

## Passenger fares

See Railroads-Fares

Successful example of tree planting. A. S. Baldwin. il Ry Age 58:856 Ap 16 '15

### Public relations

Are you making friends for your railroad? R. V. Wright. Ry Age 58:129-31 Ja 22 '15 Department of public policy and relations. Ry Age 59:375-6 Ag 27 '15

Age 59:375-6 Ag 27 '15
Pennsylvania railroad publicity. Elec Ry J 45: 1042-3 My 29 '15
Press and the rate advance case. Ry Age 58: 776 Ap 9 '15
Public influence of the railroad superintendent. W: Sproule. Ry R 57:422-3 O 2 '15
Railroad—a public servant. W. E. Williams. Ry R 57:297-8 S 4 '15
Railroads and the people: abstracts. W: Sproule. Ry R 57:668-9 N 20 '15; Ry Age 59: 1009-10 N 26 '15
Railway troubles due to lack of public undergal

Railway troubles due to lack of public understanding. W. G. Harding. Ry Age 57:1114-16

standing. W. G. Hall D 18 '14 Reasons for the unpopularity of railroads. A. M. Schoyer. Ry Age 57:1053-4 D 4 '14 Relations of the section foreman and the public. J. T. Bowser; W. E. Schott. Ry Age 58:331-2 F 19 '15

Value of publicity for railroads. O. G. Villard. Ry Age 58:1480 Je 25 '15

What the commercial agent can do for the shipper. C. K. Landes. Ry Age 59:694-5 O 15

Sce also Railroads and state

### Rails

See Rails

## Rates

Anthracite coal rates reduced in Pennsylvania. Ry Age 57:1195 D 25 '14

Arkansas rate situation. W. B. Biddle. Ry R 57:262-3 Ag 28 '15

arriers submit new plans for adjustment of transcontinental freight rates. Ry Age 58; 785-6 Ap 9 '15 Carriers submit new

Commission equalizes St. Louis grain rates. Ry R 57:72-3 Jl 17 '15

Commission forbids Chicago terminal charges. Ry R 56:868-9 Je 26 '15

Commodity rates to the Pacific coast terminals, Ry Age 58:297-9 F 19 '15

Confiscation defined by the highest authority. Ry R 56:353-5 Mr 13 '15

Decision granting the five per cent rate advance: full text of the majority opinion and dissenting opinions of chairman Harlan and commissioner Clements. Ry Age 57:1173-8 D 25 '14

D 25 '14
Decision in the Arkansas rate case. Ry Age 58:824 Ap 16 '15
Decision in the western rate advance case. Ry R 57:208-13 Ag 14 '15
Decision on anthracite rates, Ry R 57:215, 250-3 Ag 14-21 '15

Decision on anthracite rates. Ry R 57:215, 250-3 Ag 14-21 '15
Decision on the Cummins amendment. Ry R 56:705-7 My 22 '15
Decision on transportation of railroad fuel. Ry R 57:269 Ag 28 '15
Effect of the rate advance decision. D. Willard. Ry Age 58:8-9 Ja 1 '15
Five rates and prosperity. E. D. Sewall. Ry R 56:490 Ap 10 '15
Five per cent rate increase granted: the text of the decision. Ry R 55:779-81 D 26 '14
Following the commission's advice. Ry Age 57:1032-3 D 4 '14
For a 40-cent iron-ore rate, Iron Age 95:194
Ja 21 '15
Freight rates and business activity. J. W. Bettendorf. Ry Age 58:750 Ap 2 '15
Freight terminal charges at New York. Ry Age 59:375-6 Ag 27 '15
Hearings on western freight rate advances. Ry Age 58:435-43, 617-19, 783-5, 821-3, 901-2, 938-40, 1019-21, 1061-2 Mr 12-19, Ap 9-30, My 14-21 '15
Hearings on western freight rate advances;

Hearings on western freight rate advances; testimony on coal rates, etc. Ry Age 58:740-3 Ap 2 '15

Hearings on western freight rate advances; testimony on coal rates, etc. Ry Age 58:740-3 Ap 2 '15

Hearings on western freight rate advances; testimony on rates on meat packing house products, livestock, hay, cotton piece goods. Ry Age 58:700-2 Mr 26 '15

Hearings on western rate advance case. Ry R 56:309-10, 342-4, 412-13, 437-8, 472-4, 504-6, 650-2 Mr 6-Ap 10, My 15 '15

It is now up to the eastern railroads. Ry Age 57:1169 D 25 '14

Missouri allows increased passenger and freight rates. Ry R 57:664 N 20 '15

Missouri commission allows general advances in rates. Ry Age 59:942 N 19 '15

Necessity for additional revenues on western railways; brief submitted by C. C. Wright in western rate advance case. Ry Age 58: 1415-18 Je 18 '15

Net revenues in their bearing on rates. Ry R 55:696-7 D 5 '14

New era for railroads. D. Willard. Ry Age 58: 135 Ja 22 '15

New York commission lacks power to increase rates beyond legislative maximum. Elec Ry J 46:126 Jl 17 '15

New York freight terminals, 1914. Ry Age 59: 395-7 Ag 27 '15

Panama canal competition. Iron Age 95:393 F 18 '15

Plan for constructing back-haul rates laid down. Ry R 56:693 My 22 '15

F 18 '15
Plan for constructing back-haul rates laid down. Ry R 56:693 My 22 '15
Property costs as a factor in rate making. Ry R 57:277-9 Ag 28 '15
Railroad rates from investors' point of view. J: E. Oldham. Ry Age 58:89-92 Ja 15 '15
Railroads cannot equalize. Iron Age 95:624 Mr 18 '15

Ratheads granted five per cent advance. Iron Age 94:1447-8 D 24 '14
Railroad's maintenance expenses allocated between freight and passenger service. Eng Rec 72:226-9 Ag 21 '15
Railways ask rehearing of western rate case. Ry Age 59:593-7 O 1 '15
Railways of the South explain rate readjustment. Ry R 56:219-20 F 13 '15
Rate adjustments in southeastern territory. Ry. Age 58:263 F 12 '15
Rate suspensions by the Interstate commerce commission. Ry Age 58:6 Ja 1 '15
Reconsigning charges on freight shipments. J. A. Shepherd. Ry R 57:333 S 11 '15
Reduction in trans-continental rates allowed.

Reduction in trans-continental rates allowed to meet canal competition. Ry R 56:601-2 My 1 '15

Reductions ordered in rates on anthracite coal. Ry Age 59:313-18 Ag 20 '15

Spotting charges denied. Ry R 57:75-6 Jl 17

Railroads-Rates -Continued

alfroads—Rates—Continued
Supplementary order in the five per cent case.
Ry Age 57:1118 D 18 '14
Supreme court decisions in two state rate cases. Ry Age 58:630-3 Mr 19 '15
Suspension of advances in rates. Ry Age 58:
80-1 Ja 15 '15

Suspension of advances in rates. Ry Age 58: 80-1 Ja 15 '15
Tariffs on waste materials stricken out. Ry R 57:40-1 JI 10 '15
Transcontinental roads propose further reductions in rates to meet canal competition. Ry Age 59:597 O 1 '15

Age 59:597 O 1 '15

Trap car hearing. Ry Age 58:761 Ap 2 '15

Trap or ferry car service charges; opinion by Commissioner Clements. Ry Age 59:213-14

JI 30 '15; Same abr. Ry R 57:107-8 JI 24 '15

28th annual report of the Interstate commerce commission. Ry R 56:20-1 Ja 2 '15

Two important commerce commission decisions; industrial railways and car spotting charges. Ry Age 59:99-102 JI 16 '15

Ulster and Delaware railroad rate case. Elec R & W Elec'n 67:112-14 JI 17 '15

Western railways get a small rate increase. Ry Age 50:285-91 Ag 13 '15

Western rate advance case; extracts from the general brief of the carriers. Ry R 56:880-2 Je 26 '15

Western rate advance hearing; testimony of

Western rate advance hearing; testimony of protestants against the proposed advances in the rates on livestock. Ry Age 58:973-4 My 7

See also Interstate commerce commission; Railroads—Fares

### Records

Cost of structures; details to be kept in time book. Ry Age 59:760 O 22 '15 Efficient control of railroad operations. F. L. Hutchins. Ry Age 59:206 Jl 30 '15 Federal valuation of the Boston and Maine railroad. F. C. Shepherd. Boston Soc C E J 2:291-326 O '15

Greatest present need of railroads. F. L. Hutchins. Ry R 57:178-80 Ag 7 '15 I. C. C. accident reports. Ry Age 59:695-6 O

Index-record of station agents. Ry Age 59:702 O 15 '15 New accident report forms. Ry Age 59:272-3 Ag 13 '15

Ag 13 15 Track-clearance records, J. G. Wishart. Eng N 73:481-2 Mr 11 '15 True theory of railroad operating records. F. L. Hutchins. Ry Age 58:132-3 Ja 22 '15 Using a blank to prevent denurrage. H. A. Russell. Iron Age 96:415 Ag 19 '15

## Regulation

See Railroads and state

## Repair shops

800 Railroads—Sanitation; Railroads-Shops

## Rolling stock

Economy in track work and its relation to rolling stock. J. W. Powers. Ry Age 58:479

Mr. 12 '15

Mr 12 '15
Foreign rail, wheel and axle specifications. Iron Age 96:52-4 Jl 1 '15
High capacity narrow-gauge rolling stock, il diags Engineer 120:200-1 Ag 27 '15
Standardisation of railway equipment on the continent. Engineer 118:580+ D 18 '14
Upkeep of railway carriages. Engineer 120:1713 Ag 20 '15
Uses of the locomotive crane in railway service. il Ry Age 59:110-15 Jl 16 '15
See also Regrage and express cars. Cars.'

See also Baggage and express cars; Cars; Freight cars; Locomotives; Motor cars (railroad)

## Safety devices and measures

Bill for block signals, automatic stops, steel cars, headlights and investigations (Stevens bill). Ry R 56:125-7 Ja 23 '15
Extensible trap door for passenger cars, il diag Ry Age 59:207-8 JI 30 '15; Same. Ry Age (Mech ed) 89:430-1 Ag '15

Practical methods in accident prevention. G: Bradshaw. Ry R 57:46-7 Jl 10 '15

Promoting safety in the maintenance depart-ment, il Ry Age 58:148-52 Ja 22 '15

Protection of grade crossings. il Ry R 57:531-2 O 23 '15; Same cond. Ry Age 59:763-4 O 22

V 23 '10; Same cond. Ry Age 59:763-4 O 22 '15
Railroad sessions of National safety congress. Ry Age 59:813-16 O 29 '15
Railway safety and railway economics. Sci Am 112:46 Ja 9 '15
Report of the chief inspector, division of safety, Interstate commerce commission. H. W. Belnap. Ry R 56:226-7 F 13 '15
Report of the division of safety, I. C. C. Ry Age 58:99-100 Ja 15 '15
Safety and short trains. M. A. Dow. Ry Age 58:1006-8 My 14 '15
Safety first work on the Southern Pacific. W. H. Whalen. Ry Age 58:1021 My 14 '15
Safety hints to section foremen. A. W. Ross. Ry R 56:247-8 F 20 '15
Safety in care and use of industrial railways. diag Foundry 43:105-6 Mr '15; Same. Ind Eng 15:73-5 Ag '15; Same cond. Eng M 48:603-5 Ja '15
Safety problem of the railroads. W. B.

Safety problem of the railroads. W. B. Spaulding. Ry R 55:692-4 D 5 '14 Safety sidings. L. C. Frost. Sci Am 113:359 O 23 '15

23 '15
Safety spurs for a railroad grade. H. C. Plummer. il Sci Am 113:179 Ag 28 '15
Showing the train number on the engine. W. E. Watts. Ry Age 59:472 S 10 '15
Suggestions for a book of rules for the maintenance of way department, embodying the safety first idea. J. T. Bowser. Ry Age 58: 468-9 Mr 12 '15
Telltales for side clearance on railway track, diag Eng N 73:282 F 11 '15
What the railroads are doing to reduce death and injury. T: F. Logan. il Sci Am 113:144 Ag 14 '15

Ag 14

See also Air brakes; Railroads—Automatic stop; Railroads—Signals

## Sanitation

Department of sanitation, Chicago & Northwestern Ry. Ry R 56:540-1 Ap 17 '15
Steam disinfection for sewage on common carriers. diag Eng Rec 71:43 Ja 9 '15; Same (Sewage treatment on trains and boats).
Eng M 48:917-18 Mr '15

## Scrap material

See Railroads-Equipment and supplies

## Securities

Securities

Bankers and equipment trust certificates. Ry
Age 58:53-4 Ja 8 '15

French railroads as security brokers. W. S.
Hiatt. il Ry Age 59:610-12 O 1 '15

From a western investment banker's point
of view. J. H. Smith. Ry Age 58:10 Ja 1 '15

How and why French railroads sell their securities direct to the public. W. S. Hiatt.
Ry Age 59:240 Ag 6 '15

Important decision on securities alleged to be
improperly issued. Ry R 56:602-3 My 1 '15

Possible railway securities legislation. W. L.
Stoddard. Ry Age 59:946 N 19 '15

Railroad bonds; report. Ry R 57:654-5 N 20

'15

Railroad rates from investors' point of view. J: E. Oldham. Ry Age 58:89-92 Ja 15 '15 Railroad securities held abroad. Ry Age 59: 28-9 Jl 2 '15

## Shops

American railway tool foremen's 7th annual convention. Ry Age 59:193-4 Jl 30 '15 Car repair plant of the northwest system, Pennsylvania lines west, Indiana Harbor, Ind. il plans Ry R 56:175-81 F 6 '15 Car repair plant, Philadelphia & Reading Ry. St. Clair, Pa. il diags plan Ry R 57:165-9 Ag 7 '15 Chicage & Altan shore at Pleominator III.

Chicago & Alton shops at Bloomington, Ill. il plan Ry Age 58:49-51 Ja 8 '15 Conservation of material in the railroad re-pair shop. E. Cordeal. Eng M 48:827-32 Mr

C15
Cordeal: Eng M 49:211-17 My '15
Design and operation of the new shop for building steel freight and passenger cars of the Canadian Pacific Ry., at Montreal. L. C. Ord. il diags plan Eng & Contr 42:406-11 O 28 '14

Railroads-Shops -Continued

Railroads—Shops -Continued
Expert in the railroad repair shop. E. Cordeal.
Eng M 49:351-6 Je '15
Illinois Central tool system; standardization
and distribution include a central tool room
with an accurate cost system. O. D. Kinsey, if Ry Age (Mech ed) 80:361-4 Jf '15
Improvements at the Englewood locomotive
terminal and car repair plant, L. S. & M. S.
Ry., Chicago, if diags plans Ry R 55:679-83
D 5 '14

International railroad master blacksmiths' association 23d annual convention. Ry Age 59:387-9 Ag 27 '15

59:387-9 Ag 27 '15
International railroad master blacksmiths' convention. Ry Age (Mech ed) 89:471-81 S '15
Jersey Central freight car repair shops, il diags plan Ry Age (Mech ed) 89:62-6 F '15
Joint car repair shops at large terminals. F. C. Schultz. Ry Age (Mech ed) 89:30 Ja '15
Keeping a line on daily expense. A. J. Gibney. Ry R 57:468-70 O 9 '15
New Bessemer & Lake Erie blacksmith shop. il plan Ry Age 58:477-8 Mr 12 '15
New engine terminal for the O. W. R. R. & N. co., Spokane, Wash, il plans Ry R 57:586-9 N 6 '15

co., N 6

Norfolk & Western frog and switch shop at Roanoke, Va. il Ry Age 58:465-7 Mr 12 '15 Quadruple tool for planing shoes and wedges. E. A. Murray. il diags Ry Age (Mech ed) 89: 584 N '15

Railway repair shop organization. H: Gardner, Ry Age (Mech ed) 89:536-8 O '15

Ry Age (Mech ed) 89:536-8 O '15 ailway tool foremen's association; reports on special jigs, safety pneumatic tools, grinding and standardization of reamers, il diags Ry Age (Mech ed) 80:409-46 Ag '15 Railway

Reclaiming bolts with battered threads. J. P. Nolan. il Ry Age (Mech ed) 89:39-40 Ja '15 Relation of the paint shop to the repair yard. W: Buchanan. Ry Age (Mech ed) 89:28-9 Ja

Shop efficiency, G: H, Logan, Ry R 57:464-7 O 9 '15

9 '15
Shop notes from the Soo line, B. N. Lewis, diags Ry Age (Mech ed) 89:133-5 Mr '15
Standardization of methods in the railroad shop, E. Cordeal, Eng M 48:722-7 F '15
Wage systems in the railroad repair shop, E. Cordeal, Eng M 49:51-7 Ap '15
See also Car houses; Locomotive shops;

Paint shops

Signals

Alternating current signaling. Elec Ry J 46: 880 O 23 '15

Alternating current signaling. Elec Ry J 46: 880 O 23 '15
Audible signalling on railway trains in motion. W. C. Acfield. Engineer 118:603 D 25 '14
Automatic block signal installation on the B. R. & P. Ry. C. R. Happ. 11 Ry R 56:865-6 Je 26 '15
Automatic block signals for gauntlet in Miraflores tunnel. il Ry Age 59:327-8 Ag 20 '15
Automatic block signals for single-track railways. il Eng N '14:314-5 Ag 19 '15
Automatic block signals on the Western Maryland. il diag Ry Age 58:883-4 Ap 23 '15
Automatic cab-signal and train-stop system. il diags Eng N '74:614-16 S 23 '15
Automatic cab-signal system for stopping trains. diags Eng N '73:137-8 Ja 21 '15
Automatic signalling on railways. L. P. Lewis. Engineer 118:604 D 25 '14
Automatic signals on Norfolk & Western electrified line. il Ry Age 59:21-2 Jl 2 '15
Automatic signals on the Lehigh & Hudson river. il diag Ry Age 57:1179-80 D 25 '14
Beam-light signals on the Pennsylvania. Ry Age 59:61 Ja 8 '15
Block signal and interlocking extensions in 1914. Ry R 56:24-6 Ja 2 '15
Buell's cab signal and automatic train stop. il diag Ry Age 59:904-5 N 12 '15
Cab signals and automatic stops at Oroville. F. F. Bostwick. Ry Age 59:988-1000 N 26 '15
Cab signals and automatic stops on the Western Pacific. il diags Ry Age 59:645-50 O 8 '15
Clock-work time-lock for electric interlocking

Clock-work time-lock for electric interlocking machine. il Ry Age 59:699-700 O 15 '15

Concrete signal towers, Delaware Lackawanna & Western R. R. il plans Ry R 56:615-16 My 8 '15

Development of main-line signalling on railways. W. C. Acfield, diags Inst E E J 53: 763-84: Discussion. 53:784-98 Je 1 '15 Electric interlocking at Adelaide, South Australia. C. G. Pilkington. il diag Ry Age 59: 936-8 N 19 '15 Electric interlocking at Aulon, Tenn. diag Ry Age 58:392-3 Ap 30 '15 Electric train staff on the Canadian Pacific. E. S. Taylor. diags Ry Age 58:100-1 Ja 15 '15 Electrical system of cab-signalling. V. L. Raven. il diags Engineer 119:85-6 Ja 22 '15 Electro-mechanical interlocking. Ry Age 59: 414 S 3 '15

Electro-mechanical Interlocking. Ry Age 59: 414 S 3 '15
Electro-mechanical interlocking at Trenton. W. M. Post. il diags Ry Age 59:1419-20 S 3 '15
Home-made wigwag signal. F. T. Vanatta, il diag Elec Ry J 46:192 Jl 31 '15
Improvement in the operation of the pneumatic signal device. L. N. Armstrong and H. L. Sandhas. diags Ry R 56:618-21 My 8 '15
Institution of mechanical engineers: discussion. Engineer 118:608-10 D 25 '14
Interlocking at North Philadelphia. W. M. Post. il Ry Age 58:136-8 Ja 22 '15
Manual block system without station attendants. Ry Age 57:1127-8 D 18 '14
Mileage of American railroads block signaled. Ry Age 58:28-31 Ja 1 '15
Operation by signals on Baltimore & Ohio. diags Elec Ry J 46:431-5 S 11 '15
Operation of the pneumatic train signal. diag Ry Age (Mech ed) 89:296-7 Je '15
Oroville signaling criticized. M. Tainer. Ry Age 59:796-8 O 29 '15
Oscillating circuit-controller for railway signal circuits. il Elec R & W Elec'n 65:1193-4 D 19 '14
Outdoor electric substation and switch house for railway signal service. il Ry R 56:509-10
Ap 10 '15
Position light signals on the Pennsylvania R. R.

Ap 10 '15

Position light signals on the Pennsylvania R. R. il Ry R 56:487-8 Ap 10 '15

Protection of railway signal circuits against lightning disturbances. E. K. Shelton. Gen Elec R 18:1127-8 D '15

Railway signal association convention. Elec Ry J 46:580-1 S 18 '15

Railway signal association meeting, May 26-27. Elec Ry J 45:1023-4 My 29 '15

Railway signal association: spring meeting. Ry R 56:408-11 Mr 20 '15

Railway signal association 20th annual meeting. Ry Age 30:501-3 S 24 '17

R. S. A. typical circuit plans for direct current

Railway signal associated as 24 11: R. S. A. typical circuit plans for direct current automatic block signaling. A. G. Shaver. Ry R 56:614-15 My 8 '15 Rural substation in railway signal work. il Elec Ry J 45:807 Ap 24 '15 Signal and supply departments. C. R. Ahrens; R. D. Long; A. G. Shaver. Ry R 57:120-4 JI 24 '15 Signaling on railway trains in motion, diags

Signaling on railway trains in motion, diags Sci Am S 80:220-1, 236-7 O 2-9 '15 Signaling on the Chicago & Northwestern-Union Pacific system, Ry R 57:215-16 Ag 14

Simple train staff. Ry Age 58:57-8 Ja 8 '15 Single-track automatic signals on Toronto, Hamilton & Buffalo, il map Ry Age 58:1250-1

Je 11 '15
Statistical report of block and interlocking signals on the railroads of the United States. Ry Age 58:1423-6 Je 18 '15
Telltales for side clearance on railway track. diag Eng N 73:282 F 11 '15

See also Electric railroads—Signals: Railroads—Automatic stop; Wireless telegraph for railroads

Single rail

Sec Suspended railways

Snow protection and removal

Methods of handling snow on northern roads. E. R. Lewis; H. O. Whitney; A. M. Clough. Ry Age 58:144-7 Ja 22 '15 Operating Shay locomotives in winter. F. M. Leland. il Eng & Min J 99:729-30 Ap 24 '15 Snow fence of hollow clay blocks. E. G. Zorn. il Ry R 57:694 N 27 '15

#### Standards

Foreign specifications for railway material. J Fr Inst 180:615-16 N '15

Railroads -Standards -Continued Standardisation of railway equipment on the continent. Engineer 118:580+ D 18 '14

Station agents

Index-record of station agents. Ry Age 59:702

O 15 15 Instruction in station service on the Chicago & Alton. Ry Age 58:1051 My 21 '15 Second-quality station agents. Ry Age 59:84 Jl 16 '15

#### Stations

Canadian Pacific terminal improvements at Vancouver, il plan Ry Age 58:614-16 Mr 19

vancouver, it plan Ry Age 58:614-16 Mr 19

15

Design and construction of small stations, it
plans Ry Age 58:1065-71 My 21 '15

Double-deck freight station at Pittsburgh, it
plans Eng N 74:496-8 S 9 '15

Kansas City—national train indicators, it Ry
Age 58:272-3 F 12 '15

Kansas City Union station lighting, it Elec W
65:1253-5 My 15 '15

Memphis—new I. C. station and track elevation, it plan Ry Age 58:179-81 Ja 29 '15

Memphis, Tenn., central station, it plans Arch
& Bldg 46:476-8 D '14

Montreal station—illumination features, it Elec
W 65:334-5 F 6 '15

Morristown, N. J.—new passenger station of
the D. L. & W. R. R. it plans Ry R 55:73541 D 19 '14

New freight and transfer station at Pittsburgh, Pennsylvania R. R. it Ry R 56:27880 F 27 '15

Passenger station of the Chicago Great West-

Passenger station of the Chicago Great Western and Chicago Rock Island & Pacific railroads at Mason City, Iowa. E. G. Zorn. in plan Ry R 57:263-5 Ag 28 '15
Proposed passenger terminals at Buffalo. il plan Ry R 56:338-40 Mr 13 '15
Railway stations and architecture. Ry R 57: 691-2 N 27 '15
Remodeling a frame station building. H. H. See. il plans Bldg Age 37:33-6 Je '15
St. Paul, Minn.—plans for the new Union station diags Ry Age 58:261-3 F 12 '15
Station and office building of the Michigan Central railroad at Detroit. il Arch & Bldg Train indicators at Euston. London station

Train indicators at Euston, London, station.
ij Ry Age 58:739 Ap 2 '15
Union passenger station, Kansas City, Mo. il
Arch & Bldg 47:226-9+ Je '15

See also Elevated railroads—Stations; Railroads—Buildings; Railroads—Terminals; Railroads—Train sheds

## Statistics

Comparative statistics of the world's railways. Ry Age 59:805-8 O 29 '15
Comparative summary of freight cars in service; tabulation. Ry Age 59:660-2 O 8 '15
Interstate commerce commission statistics.
J. L. Hopkins. Ry Age 58:922 Ap 30 '15
Railway mileage of the world. Ry Age 58:1468
Je 25 '15
Railway regulation bandings of the world.

Railway regulation handicapped by muddled official statistics. Ry R 56:130-1 Ja 23 '15 Railway returns for 1913. Engineer 120:371, 388 O 15-22 '15

True theory of railroad operating records. F. L. Hutchins. Ry Age 58:132-3 Ja 22 '15

See also Railroads-United States

## Storehouses

New storehouse of the A. T. & S. F. Ry. at Albuquerque, N. M. A. B. Wachter, il Ry R 57:683-5 N 27 '15

## Stores

See Railroads-Equipment and supplies

## Switches, frogs, etc.

Essential elements in the design of switch connections. W. F. Rench. Ry Age 58:333-4 F 19 '15

F 19 '15 Formulas for locating frogs and switches, S. S. Roberts; A. Bull. Eng N 73:84-5 Ja 14 '15 Location of frogs for an unsymmetrical Y-track. G. W. White. Eng N 74:124 Jl 15 '15 Making and repairing frogs and crossings. F. A. Watts. Ry Age (Mech ed) 89:471-2 S '15

New turnbuckle for switch adjustment, il diag Ry Age 58:163 Ja 22 '15
Norfolk & Western frog and switch shop at Koanoke, Va. il Ry Age 58:465-7 Mr 12 '15
Points for slip switch installation. W. F. Rench. Ry Age 59:120 Jl 16 '15
Practical formula for switch lead. C: C. Wentworth. Eng N 73:734 Ap 15 '15
Remote switches moved by battery current. Ry Age 58:831 Ap 16 '15
Repairing frogs and switches on the Katy. G: P. White. Ry Age 59:970-1 N 19 '15
Standard point switch for either hand-throw or interlocking connections, N. Y. C. R. R. diags Ry R 56:650 My 15 '15
Switch inspection and test. W. F. Rench. Ry Age 57:1144 D 18 '14

See also Railroads—Crossings; Railroads

Railroads—Crossings; Railroads See also -Track Switching

Impact between freight cars in switching service. L. E. Endsley. il Ry R 57:10-13 Jl 3'15; Abstract. Elec Ry J 45:1164 Je 19'15

## Telegraph

See Telegraph; Wireless telegraph for railroads

### Terminals

Alternative plans for rearranging Chicago freight terminals, plans Ry R 56:869-72 Je

Automatic telephone system at the Kansas City terminal. il Ry R 55:768-70 D 26 '14
Bumping posts that do the work demanded. diags Eng Rec 72:474 O 16 '15
Canadian Pacific terminal improvements at Vancouver. il plan Ry Age 58:614-16 Mr 19 '15
Chicago railway terminal commission makes recommendations. Eng Rec 71:758-9 Je 12 '15
Concrete warehouses and terminal plant at New Orleans will cover 100 acres. il plan Eng Rec 71:402-3 Mr 27 '15
Delaware & Hudson terminal at Albany, N. Y. il plan Ry Age 59:58-60 Jl 9 '15
Denver, Colo. railway terminal. diags plan Eng N 73:639-1 Ap l '15
Developments at the Grand Central terminal in New York, il plan Ry R 57:229-34 Ag 21

Difficult phases of terminal operation, C. A. Pennington, Ry Age 57;1091-2 D 11 '14 Economic value of terminal improvements at Detroit, Ry Age 59;739-40 O 22 '15 Freight terminal, C. M. Himmelberger, Ry Age 59:563-4 S 24 '15

Den-Freight tern Freight tern Lue 59:563-

Hearing on Boston railroad terminals. Ry R 57:695-6 N 27 '15 Hot-water heating system at Grand Central terminal. W. G. Carlton. Power 42:245-6 Ag

How the operation of one terminal was improved. G. D. Brooke. Ry Age 58:1121-4 My

proved. G. D. Brooke. Ry Age 58:1121-4 My 282 '15
Kansas City terminal power plant. il Elec W 65:1468-70 Je 5 '15
Lackawanna passenger terminal at Buffalo. maps Eng Rec 71:334-6 Mr 13 '15
Lehigh Valley passenger and freight terminals at Buffalo. il plan Ry Age 59:158-9 Jl 23 '15
Making a physical valuation of large terminals. C. L. Van Auken. Ry Age 59:127-9 Jl 16 '15
New railway passenger terminal at St. Paul, Minn. plans Eng N 73:488-9 Mr 11 '15
New terminal for the Southern at Birmingham, Ala. il diags Ry Age 59:743-6 O 22 '15
New type of chart shows operation of Chicago terminal. Eng Rec 72:445-6 O 9 '15
Pittsburgh North side freight station of the P. R. R. H. M. Phelps. ii plans Ry Age 59:245-6 Ag 6 '15
Railway problem of London. map Engineer 119:619-20 Je 25 '15
Railway terminal projects in Cleveland. Ry F 57:153 Jl 31 '15
Reconstruction of the Jersey City termina vards iil n'an Ry Age 58:787-91 Ap 9 '15

F7:153 Jl 31 '15

Reconstruction of the Jersey City termina yards, il p'an Ry Age 58:787-91 Ap 9 '15

Report of Chicago railway terminal commission. Ry Age 58:1163-4 Je 4 '15; Abstract Eng N 71:42 Jl 1 '15

St. Louis, inadequate terminal facilities. Ry Age 59:147-8 Jl 23 '15

St. Paul and Oregon-Washington joint terminals in Spokane. il plans Ry Age 58:85-8 J: 15 '15

Railroads-Terminals -Continued

Railroads—Terminals—Continued
Santa Fe to solve Chicago fruit terminal problem. plan Eng Rec 71:819-20 Je 26 '15
Spokane terminal improvement involved variety of engineering construction, il plan Eng Rec 71:234-6 F 20 '15
Terminal facilities at San Diego, il plans Elec Ry J 45:587-8 Mr 20 '15
Terminal improvements of the Canadian Pacific railway at Vancouver, il plan Eng N 73:310-1 F '18 '15
Terminal improvements of the Canadian Pacific railway at Vancouver, il plans Ry R 56: 380-5 Mr 20 '15
Track layout and signals of the Jersey City passenger terminal of the Central R. R. of New Jersey, diags plan Ry R 56:647-50 My 15 '15
Troublesome problems of terminal operation

Troublesome problems of terminal operation. Ry Age 58:695-6 Mr 26 '15 Viaduct construction on the Kansas City terminal. A. R. Eitzen. il diag Ry Age 58: 397-400 Mr 5 '15

See also Locomotive terminals; Railroad—Stations; Railroads—Train sheds; Railroads—Yards; Street railroads—Terminals Rail-

#### Ticket offices

Centralized ticket offices for St. Louis rail-roads. plan Ry Age 57:1042 D 4 '14 Ticket offices of large passenger terminals. Ry Age 58:1411-14 Je 18 '15

#### Tool houses

Stoves in tool houses. Ry R 57:624 N 13 '15

## Tools and implements

Proper repair of tools for track maintenance, M. E. Carroll. il Ry Age 59:952-4 N 19 '15 Railway mowing and weed-cutting machines, il Eng N 73:822-3 Ap 29 '15 Tool equipment for maintenance of way forces, Ry Age 59:337-41 Ag 20 '15 Tools for section and extra track gangs. P. J. McAndrews. Ry Age 59:338 Ag 20 '15 Tools for the water service and bridge and building departments. E. M. Grime, Ry Age 59:340-1 Ag 20 '15 Tools for track gangs. Ry Age 59:337-8 Ag 20 Tools for track gangs. Ry Age 59:337-8 Ag 20

Tools for track gangs. Ry Age 59:337-8 Ag 20

Up-keep of track tools, M. E. Carroll, il Ry R 57:341-3 S 11 '15

#### Track

Track

A. R. E. A. committee report on roadway. Ry 18 56:393-4 Mr 20 '15

Battery locomotive for track laying, il Engineer 119:585-6 Je 11 '15

Building a permanent railway track on a pile foundation, il diag Eng N 73:200-1 F 4 '15

Concrete eliminates soft spots in railway roadbed, J. T. Bowser, Eng Rec 72:506 O 23 '15

Designing manganese steel track work, 'V. Anserer, Ry Age 59:341-2 Ag 20 '15

Development of special steels for track work, W. C. Cushing, Ry Age 59:747-51 O 22 '15

Digging track ditches, K. L. Van Auken, il Ry Age 59:355-6 Ag 20 '15

Ditching and cleaning track, J. Snyder, Ry R 57:650-1 N 20 '15

Draining embankments in Missouri, il Ry Age 58:1438-9 Je 18 '15

Economy in the use of track material, J. T. Bowser, Ry R 57:239 Ag 21 '15

Economy in track work and its relation to rolling stock. J. W. Powers, Ry Age 58:4479

Mr 12 '15

Economy methods in track work, W. C. Nisbet, Ry Age 58:1433-4 Je 18 '15

Flangeway guards and frog guard-rails, diags Eng N 73:1031 My 27 '15

General makeup of track for heavy traffic, Ry R 57:406-9 S 25 '15

Important elements in the maintenance of track, W. F. Rench, Ry Age 58:1439-40 Je 18 '15

Inclination of the rail in economic railroad

Inclination of the rail in economic railroad practice. J: Lundie. Ry Age 59:335-6 Ag 20

Laying rail on a busy line. W. F. Rench. Ry Age 58:1083 My 21 '15 Laying rail on the Lehigh valley. G. L. Moore. Ry Age 58:1084-5 My 21 '15

Laying rail with the help of locomotive cranes. il Ry Age 59:353-4 Ag 20 '15

Lighting plant for tracklaying, Priesha Upington Kalkfontein Ry. N. K. Prettejohn. il Ry R 57:515-16 O 23 '15
Magnolia cut-off improvement on the Baltimore and Ohio railroad. A. W. Thompson. il maps Eng Soc W Pa 30:823-7 D '14
Manganese steel track-work specifications. Elec Ry J 45:1118 Je 12 '15
Measuring stresses in railway roadbeds. diag Eng N 73:743 Ap 15 '15
159-pound girder rail for Philadelphia streets. diag Eng Rec 72:254 Ag 28 '15
Organization for track maintenance from a committee report to the Roadmasters' and maintenance of way association. Ry R 56: 221-4 F 13 '15
Organization of section forces and methods for

221-4 F 13 '15
Organization of section forces and methods for maintaining and policing track. Ry Age 59: 517-22 S 17 '15
Permanent track maintenance force on the Long Island R. R. Eng N 73:474-5 Mr 11 '15
Pneumatic tie tamper. il Ry Age 58:473-4 Mr

Promoting the growth of vegetation on the slopes, W. F. Rench. Ry Age 58:471-2 Mr 12 slopes.

Proper repair of tools for track maintenance. M. E. Carroll. il Ry Age 59:952-4 N 19 '15 Proposed standard specification for quenched carbon steel track bolts. Ry Age 59:62-3 Jl 9 '15; Same. Iron Tr R 57:43-4 Jl 1 '15 Putting in service a new line with dense traffic. W. F. Rench. Ry Age 59:531 S 17 '15 Rail laying. H. G. Olmstead. Ry Age 58:462-3 Mr 12 '15 Rail laying on sines of moderate traffic. E. R. Lewis. Ry Age 58:1083-4 My 21 '15 Railroad tracks as conductors for telephonic communication. il Sci Am 113:363+ O 23 '15 Rapid improvement of a section. K. L. Van Auken. Ry Age 59:963-4 N 19 '15 Recent important developments in ballast prac-

Auken. Ky Age 59:363-4 N 19 '15
Recent important developments in ballast practice. Ry Age 58:1436-8 Je 18 '15
Renewing bridge ties on the Lehigh Valley with a locomotive crane. il Ry Age 59:526
S 17 '15

Results gained with a ballast dresser, il Ry Age 59:529-30 S 17 '15 Roadmasters' and maintenance of way asso-ciation 33d annual convention. Ry R 57:324-6 S 11 '15

S 11 '15
Smoothing a railway subgrade to insure good drainage. Eng N 73:498-9 Mr 11 '15
Special railway track for Philadelphia streets.
diags Eng N 74:929 N 11 '15
Standard track construction on the Great
Eastern railway of England. W. A. D. Short.
diags Ry Age 59:130 Jl 16 '15
Steady employment for section men, on the
Long Island R. R. C. King. Ry R 56:539-40
Ap 17 '15
Stresses in track. Ry R 56:412 Mr 20 '15

Ap 17 '15
Stresses in track. Ry R 56:412 Mr 20 '15
Suggested organization for track maintenance.
G. C. Crites. Ry Age 57:1148 D 18 '14
Tamping track with air power, il Eng N 72:
1219 D 17 '14
Tie-plate with inclined face, diag Eng N 74:
987 N 18 '15
Tools for section

Tools for section and extra track gangs. P. J. McAndrews. Ry Age 59:338 Ag 20 '15 Tools for track gangs. Ry Age 59:337-8 Ag 20

Track and roadhed. G: H. Pegram. Elec Ry J 46:624 S 25 '15

Track force for renewing rails. Eng N 74:752-3 O 14 '15

rack labor problem. E. T. Howson. Ry Age 59:522-4 S 17 '15 Track

Track maintenance. K. L. Van Auken. Ry R 57:526-9, 660-3 O 23, N 20 '15

Transverse fissures the result of rail gagging.
P. H. Dudley, il Ry Age 59:1001-4 N 26 '15

Up-keep of track tools. M. E. Carroll, il Ry R 57:341-3 S 11 '15 Vaughan track indicator, il Ry Age 59:970 N

See also Ballast; Guard rails; Rail fastenings; Railroad tie plates; Railroad ties; Railroads—Clearance; Railroads—Construction; Railroads—Crossings; Railroads—Curves and turnouts; Railroads—Gages; Railroads—Grades; Railroads—Switches; Railroads—Switches; Rails; Spikes (railroad)

## Railroads-Continued

Track depression

Track depression

Elimination of the Tower Grove crossings, St. Louis, Mo. S. L. Wonson, il diags plans Assn Eng Soc J 55:95-115 O '15; Same cond. Ry Age 59:799-802 O 29 '15; Same cond. Eng Rec 72:627-9 N 20 '15

Track depression at Mattoon; Illinois Central R. R. il diag plan Eng N 74:110-12 Jl 15 '15

Track depression at Minneapolis, diags Eng N 73:514-17 Mr 18 '15

Track depression work of the C. M. & St. P. Rv. at Minneapolis, il Ry R 57:69-72 Jl 17 '15

Ry. at

#### Track elevation

Chicago track elevation; Rock Island lines, il diags Eng N 73:670-5 Ap 8 '15
Concreting trains for track-elevation work, il Eng N 74:315-17 Ag 12 '15
Factors in grade separation. Eng N 73:422-3 Mr 4 '15
Grade crossing elimination in North Toronto, Ontario, il diag plan Ry Age 59:555-8 S 24 '15
Heavy plate girders in track elevation work in

Heavy plate-girders in track-elevation work, il Eng N 73:1036-7 My 27 '15

New I. C. station and track elevation at Memphis, il plan Ry Age 58:179-81 Ja 29 '15

Pennsylvania track elevation through Wilkinsburg, Pa. il plans Ry Age 59:654-8 O 8 '15

Rock Island track elevation work at Chicago, il diags Ry Age 58:690-4 Mr 26 '15

Temporary timber walls for track elevation, il Eng Rec 71:646 My 22 '15

Tinree-level railway crossing at Chicago, il diags plans Eng N 73:708-10 Ap 15 '15

Track elevation at Lynn, Mass. C: B. Breed, il diags plans Eng N 74:533-7 S 16 '15

Track elevation on the Nickel Plate railroad at Chicago, il diag map Eng N 74:888-91 N 4

Track elevation work of the Chicago & Western Indiana R. R., in Chicago, il plan Ry R 57:651-3 N 20 '15

See also Elevated railroads

#### Track Inspection

Conducting track inspection on the Grand Trunk, il Ry Age 57:1145-7 D 18 '14 Development of P. R. R. track inspection sys-tem. J. T. Richards, il Ry Age 58:153-6 Ja 22 '15

Methods of conducting annual track inspec-tions. Ry Age 58:325-9 F 19 '15

## Traffic

Effects of the Panama canal on railway traffic. Ry Age 57:1111-12 D 18 '14 Transportation in Chicago during a traction strike. il Ry Age 58:1469-74 Je 25 '15

## Train load

Early tonnage studies. Ry Age 59:972 N 19 '15 Scientific train loading; tonnage rating. O. S. Beyer, jr. Ry Age 59:507-11 S 17 '15; Same. Ry Age (Mech ed) 89:502-5 O '15; Same abr. Ry R 57:594-8 N 6 '15

#### Train sheds

English railway trainshed: Great Western Ry. station in Birmingham, il diags plan Eng N 72:1112-14 D 3 '14

Unit-built concrete umbrella sheds, Los Angeles, California. R. R. Newman, il diags Concrete Cem 7:20-2 Jl '15

### Train speed

Premiums for freight train speed. Ry Age 58: 977-8 My 7 '15

Cost of stopping and starting trains. F. W. Green. Ry R 56:655-7 My 15'15 Cost of train limit legislation. Ry Age 58:979-80 My 7'15

80 My 7 '15
Handling of local or way-freight trains. R. R. Farmer. Ry Age 57:1117 D 18 '14
Limiting length of trains by law. M. W. Potter. Ry Age 58:268 F 12 '15
Limiting the length of trains. Ry Age 58:392
Mr 5 '15
Mr 5 '15

Mr 5 '15 Local freight train. F. H. Garner. Ry Age 59:394 Ag 27 '15

Maximums and minimums in train operation.
A. Price. Ry R 56:286-9 F 27 '15; Same. Ry
Age 58:401-3 Mr 5 '15
Relation between the number of trains and
passing points. P. M. La Bach. Ry Age 59:
197-8 Jl 30 '15
Safety and short trains. M. A. Dow. Ry Age
58:1006-8 My 14 '15
Standard code on the Buffalo, Rochester &
Pittsburgh. Ry Age 58:619-20 Mr 19 '15

See also Hospital trains; Railroads-Work

## Bibliography

Minimum train crews and maximum length of trains legislation in the United States. Special Libraries 6:25-39 F '15

## Trespassing

Enforcing the laws against trespassing. Ry Age 58:202 Ja 29 '15
Railroad and the hobo. E. W. Camp. Ry R 57:396-7 S 25 '15; Same cond. Ry Age 59: 460 S 10 '15

Repressing trespassers on the New Haven. Ry Age 59:696 O 15 '15 While other accidents decline trespassing accidents still increase. Ry Age 59:453 S 10 '1

## Valuation

Valuation

Accommodations de luxe for federal valuation engineers, plan Eng Rec 70:696-8 D 26 '14 Actual railroad contingencies and what they cost. Eng Rec 71:774 Je 19 '15 Appraisal of the Fere Marquette lines in Michigan; abstract of a report to the railroad commission. M. E. Cooley. Ry Age 58: 376-7 F 26 '15 Appraisal report of Pére Marquette railroad filis ten large boxes, il Eng Rec 71:200-2 F 13 '15 Ellion dollar confiscation. M. W. Gaines Ry.

Age 58:1150-2 Je 4 '15 Calculating cross section areas on railroad valuation work, F. T. Morse, Ry Age 59:29

Jl 2 '15 Chicago & Northwestern Ry. valuation work. Eng N 74:843-5 O 28 '15 Commerce commission hears railroads on valuation. Eng Rec 72:461-2 O 9 '15 Conference on federal valuation. Elec Ry J 45: 1031 My 29 '15 wight of work valuation.

valuation. Eng Rec 72:461-2 O 9 '15 Conference on federal valuation. Elec Ry J 45: 1031 My 29 '15
Considerations in right of way valuation. H. P. Gillette. Ry Age 58:1483-4 Je 25 '15; Same. Eng & Contr 43:572-3 Je 30 '15
Cost of valuation. J. MacDonald. Elec W 65: 589 Mr 6 '15
Cost of valuation. J. MacDonald. Elec W 65: 589 Mr 6 '15
Cost of valuation to the New York New Haven & Hartford R. R. Ry R 57:90 Jl 17 '15
Depreciation and confiscation. A. C. Humphreys. Ry Age 59:311-12 Ag 20 '15
Developments in connection with federal valuation. Ry R 57:633 N 13 '15
Developments in railway valuation. Ry R 56: 653 My 15 '15
Elements of railroad value that might be overlooked. Eng Rec 71:523-4 Ap 24 '15
Federal railway-valuation work. G: H. Burgess. Eng N 74:12-14 Jl 1 '15
Federal valuation of joint facilities. R: J. McCarty. Ry Age 58:699 Mr 26 '15
Federal valuation of the Boston and Maine railroad. F. C. Shepherd. Boston Soc C E J 2:291-326 O '15; Same abr. Ry R 57:665-7 N 20 '15
Federal valuation of the railroads in the United States. Ry R 57:461, 470-2, 485-7 O 9-16 '15
Form proposed for federal valuation report.

Form proposed for federal valuation report. D. F. Jurgensen. Eng Rec 72:484-5 O 16 '15 Fundamental problems involved in railway valuation. Ry Age 58:1146-50 Je 4 '15 How the federal evaluation of the Boston & Maine railroad is being done. F. C. Shepherd. Eng Rec 72:538-41 O 30 '15 Instructions for roadway and track men on federal valuation: abstract of second tentative draft issued by Interstate commerce commission. Eng Rec 70:638-40 D 12 '14; Ry Age 58:62-4 Ja 8 '15 Interstate commerce commission hearing on valuation. Ry Age 59:651-3 O 8 '15 Land reproduction cost figured by a definite method. H. V. Hayes. Eng Rec 72:626 N 20 '15

Railroads—Valuation—Continued

Making a physical valuation of large terminals, C. L. Van Auken, Ry Age 59:127-9 Jl

Adding a physical valuation of large terminals. C. L. Van Auken. Ry Age 59:127-9 Jl 16 '15

Mileage of government valuation inventory tabulated. Eng Rec 72:601 N 13 '15

Practical limit of detail in the federal valuation. Ry Age 58:44 Ja 8 '15

Preparing for the federal valuation of the railways. Ry Age 58:107-9 My 28 '15

Progress of federal railroad evaluation. Eng Rec 71:40 Ja 9 '15

Progress of federal valuation. Ry R 56:518-19

Ap 17 '15; Eng Rec 71:485-6 Ap 17 '15

Railroad and public officials discuss federal valuation in three-day conference. Eng Rec 71:728 Je 5 '15

Railway-valuation office index and file system. H. J. Saunders. Eng N 71:891-6 N 4 '15

Recent progress in the federal valuation work, it diags Ry Age 59:569-71 S 24 '15

Reproduction basis of valuation criticised. J; M. Eshleman. Eng Rec 72:625-6 N 20 '15

Suggested form of inventory for valuation of common carrier property. D. F. Jurgensen. Assn Eng Soc J 55:129-38 O '15

Tangled theories of railway valuation. Eng & Contr 43:567 Je 30 '15

Valuation conference in Washington, March 22. Eng Rec 71:324-5 Mr 13 '15

Valuation methods on the Big Four. Ry Age 59:727 O 22 '15

Valuation of railways Ry Age 57:1110 D 18 '14

Wash borings aid in railroad valuation work, it

Age 59:727 O 22 '15
Valuation of railways. Ry Age 57:1110 D 18 '14
Wash borings aid in railroad valuation work, il
Eng Rec 71:776 Je 19 '15
What shall be done regarding the valuation?
Ry Age 58:174-5 Ja 29 '15
When is land used for common carrier purposes? Eng Rec 71:424 Ap 3 '15
Why the valuation should not be discontinued.
C: A. Prouty. Ry Age 58:7-8 Ja 1 '15

## Water supply

Water supply

Bacteriological standard for drinking water on common carriers. Eng Rec 70:617-18 D 5 '14; Eng N 72:1203 D 17 '14; Munic J 37:924 D 24 '14; Eng & Contr 43:77 Ja 27 '15; Am Water Works Assn J 2:67-73 Mr '15

Cool drinking water for passengers on Indian railways. diags Ry R 57:372-3 S 18 '15

Examination of drinking water on railway trains. E: Bartow. Am Water Works Assn J 2:74-82 Mr '15

Bailway roadside water tanks for locomotive

Railway roadside water tanks for locomotive supply; with comparative costs of wood and steel structures, diags Ry Age 59:955-8 N 19 '15; Abstract. Ry R 57:517-18 O 23 '15 Reinforced concrete for railway water tanks. J. T. Bowser. Eng Rec 71:81-2 Ja 16 '15 Treatment of water for locomotive use. W. A. Pownall. Am Water Works Assn J 2:434-41 Je '15; Same, Ry R 56:470-2 Ap 3 '15 Water service tests. P. M. La Bach. Ry Age 59:536 S 17 '15 Water waste. C. R. Knowles. il Ry Age 59:756-8 O 22 '15

See also Water tanks

## Work trains

Making records with loading machines, F. N. Loughnan, il Ry Age 58:1443 Je 18'15

### Yards

Chicago freight interchange yard, il plans Eng

N 78:1153-6 Je 17 '15 Combination through classification and terminal yard. W. C. Copley. Ry Age 58:51-2 Ja 8 '15

o 15 Co-operation in yard operation. H. H. Larson. Ry Age 59:89-90 Jl 16 '15 Finley yard of the Southern railway at North Birmingham, Ala. il plans Ry R 57:355-60 S 18 '15

18 '15
Preight terminal car checking system, I. T.
Tyson. Ry Age 58:748-9 Ap 2 '15
Interchange problem in yard operation. E. C.
Tucker. Ry Age 58:1474 Je 25 '15
Measurement of efficiency in yard operation.
J. W. Roberts. Ry Age 58:1246-7 Je 11 '15
New type of chart shows operation of Chicago terminal. Eng Rec 72:445-6 O 9 '15

Operating the Milwaukee (Wis.) terminals of the St. Paul. W. B. Hinrichs. Ry Age 57: 1050-1 D 4 '14 Operation of large yards. A. M. Umshler. Ry R 55:750-3 D 19 '14

R 55:750-3 D 19 '14
Personality and experience. R: Brooker. Ry
Age 59:204 Jl 30 '15
Practical problems of terminal operation, Ry
Age 58:240-1 F 5 '15
Proposed gantry crane for car repair yards.
W. E. Johnston, plans Ry Age (Mech ed) 89:

304 Je '15
Qualifications of a terminal superintendent.
S. W. Roberts. Ry Age 59:434-5 S 3 '15
Railway classification yard lighting; with discussion. D. P. Morrison. il plans Eng Soc W Pa 30:641-68 O '14
Rolling resistance of cars over switches and frogs. C. L. Eddy. Ry Age 58:796-8 Ap 9 '15
Terminal proposition. R. M. Baker. Ry Age 59:191-2 Jl 30 '15
Troublesome problems of terminal operation.

roublesome problems of terminal operation. Ry Age 58:695-6 Mr 26 '15 Troublesome

See also Railroads-Switching

#### Alaska

Alaska railroad; route and cost. Eng Rec 71: 479 Ap 17

Alaskan government railroad, map Ry Age 59:230 Ag 6 '15 Alaskan government railway, map Ry Age 58: 896 Ap 23 '15

896 Ap 23 '15 Alaskan railroad surveys. D. L. Reaburn. il Eng N 73:104-6 Ja 21 '15 Government railway of Alaska. map Eng & Contr 43:sup25 Ap 14 '15 Government's Alaskan railway. il map Ry R 57:393-6 S 25 '15

57:393-6 S 25 '15
Progress on the Alaska railway surveys. Ry
Age 58:32 Ja 1 '15
Progress on the Alaskan railways. il Eng N
74:43-4 Jl 1 '15
Route of the Government Alaskan railroad.
map Eng & Min J 99:705-6 Ap 17 '15
Seward-Susitna route chosen for Alaska railroad. map Eng Rec 71:482-3 Ap 17 '15
U. S. government's Alaskan railway. map Ry
R 56:528-31 Ap 17 '15

## Australia

Proposed transcontinental railroads of Australia, W. D. Hornaday, map Ry Age 58:782 Ap 9 '15

## British Columbia

Comparison of the old and new lines of the Canadian Pacific at Rogers Pass, B. C. J. G. Sullivan. Ry Age 58:194-5 Ja 29 '15

## Burma

Southern Shan states railway, il map Engineer 119:502-3 My 21 '15

## Canada

Canadian Northern Ry. opened to the Pacific coast. il map Eng N 74:1098-9 D 2 '15
Grand Trunk Pacific railway. map Eng N 74:
245 Ag 5 '15
Operating results of Canadian railways in 1914.
J. L. Payne. Ry Age 58:687-9 Mr 26 '15
Report on Canadian railways. Ry R 57:365 S
18 '15

See also Railroads and state-Canada; Van Buren bridge route

## China

American engineer in China. W: B. Parsons. il Jr Fr Inst 179:390-406 Ap'15; Abstract. Eng M 49:430-4 Je'15

M 49:430-4 Je 15
Railways in China. il map Engineer 117:443-4, 501-2, 564-6, 611-12, 666-8; 118:6-7, 85-6, 154-5, 453-4; 119:131-2, 197, 347-8; 120:115-16 Ap 24, My 8, 22, Je 5, 19, Jl 3, 24, Ag 7, N 13 '14, F 5, 26, Ap 9, Jl 30 '15
Status of Chinese railways. C: D. Jameson. Ry Age 59:602 O 1 '15

## England

Railway problem of London, map Engineer 119:619-20 Je 25 '15

## Europe

oreign rail, wheel and axle specifications. Iron Age 96:52-4 Jl 1  $^{\prime}$   $^{\prime}$  15 Foreign rail,

Railroads-Europe-Continued. Transportation in Europe, A. Stucki, Ry Age 59:194-7 Jl 30 '15

#### France

Efficiency of French women as railway workers. W. S. Hiatt, il Ry Age 59:943-5 N 19 '15 France saved by her railroad men. W. S. Hiatt, Ry Age 58:1047-8 My 21 '15 French passenger service. Ry Age 59:798 O 29

French railroad excursions in war time. W. S. Hiatt. Ry Age 59:468-9 S 10 '15 French railroads as security brokers. W. S. Hiatt. il Ry Age 59:610-12 O 1 '15 French railway accidents in war-time. W. S. Hiatt. Ry Age 59:1015-16 N 26 '15 French railways in war time. Ry Age 58:1422-3 Je 18 '15 How a destroyed French railways in war time.

a destroyed French railroad helps its cloyees. W. S. Hiatt. Ry Age 59:386 Ag employees. 27 '15

How and why French railroads sell their securities direct to the public. W. S. Hiatt. Ry Age 59:240 Ag 6 '15

#### Germany

Achievements of the state railway lines of Germany. W. M. Acworth. Ry Age 59:725 O

German railways and the war. Engineer 119: 186 F 19 '15; Same. Sci Am S 79:254 Ap 17

Germany's strategic railways. V: Cambon. maps Eng M 49:93-6 Ap '15 Great achievements of German state railroad lines. F: W: Wile. Ry Age 59:428-30 S 3 '15: Same. Sci Am S 80:218-19 O 2 '15

## Great Britain

Annual report of the railways of the United Kingdom. Ry Age 59:690 O 15 '15 English railway men's war bonus. Ry Age 59:

899 N 12 1b Necessaries of life and British railways. Engineer 119:186 F 19 '15 Number and types of locomotives on British railways. Engineer 120:108-9 Jl 30 '15 Railway year. Engineer 119:274-5, 297, 325-6 Mr 19-Ap 2 '15

railways. Engineer 120:160-5-81 Railway year. Engineer 119:274-5, 297, 325-6 Mr 19-Ap 2 '15
Statistics of English railways in war time.
J. H. Parmelee. Ry Age 58:1241 Je 11 '15
War bonus for English railwaymen. Ry Age
58:447 Mr 12 '15
War performance of British railways. Ry R
57:452 O 9 '15

See also Railroads and state-Great Britain

## Hawaiian Islands

Rapid growth of Hawaiian railway. Ry R 57: 73-4 Jl 17 '15

### India

British-built hopper cars for the Bengal-Nag-pur Ry. F. C. Coleman, il Ry R 57:432-3 O 2

British India. U S Sp Cons Rep 72:73-80 '15 Status of Indian railways. V: Bayley. Ry Age 59:600-2 O 1 '15

#### Italy

Italian railways. L. Luiggi. Ry Age 59:599-600 O 1 '15

#### Mexico

Mexican railway; 1873 and 1915, W: R. East-man: W. T. Ingram, il map Eng N 74:1016-18 N 25 '15

Two desert railway lines merged. C: A. Byers. map Ry R 55:743 D 19 '14

## New England

New England and the New Haven road. H. Elliott. Ry Age 58:881-2 Ap 23 '15 New England railroad situation, Ry Age 58: 729-31 Ap 2 '15

New England railroads in 1845, map Ry Age 58: 59:471 S 10 '15 Situation in New England, Ry Age 58:176-7 Ja 29 '15

## New South Wales

Deficit for government railways despite rate increases. Ry R 57:536-7 O 23 '15

## New Zealand

New Zealand railways. Engineer 118:563 D 11

#### Palestine

Railway lines of Syria and Palestine. L. R. Freeman. il map Ry Age 59:199-203 Jl 30

## Panama

Railway construction in republic of Panama. R. W. Hebard. Eng & Contr 43:sup29-30 My 19 '15

#### Russia

Freight equipment cars for the Russian government, il diags Ry R 57:419-22 O 2 '15 General locomotive. Sci Am 112:212 Mr 6 '15 Private railways excel in Russia. Ry R 55:684-5 D 5 '14

5 D 5 '14 uggestions regarding the determination of the properties of steel; Russian railway tests. A. N. Mitinsky. Am Inst Min E Bul 104:1697-1705 Ag '15; Abstract. Iron Age 96:462-3 Ag 26 '15; Same cond. (Proportional limit is prime factor) Iron Tr R 57:1184-6 D 16 '15 Suggestions

#### Siberia

Construction work on the Amur (Siberian) railway, W. A. D. Short. il Ry Age 59:971-2 N 19 '15

#### South America

Transandine railways of Chile and Argentina. Ry R 56:324 Mr 6 '15

#### Switzerland

Furka railway; a new Alpine railway from the Furka railway; a new Alpine railway from the Rhône to the Rhine. A. Gradenwitz. il Sci Am S 79:344-5 My 29 '15
Opening of the Mont d'Or tunnel. il map Engineer 119:505-6, 508 My 21 '15
Railway engineering work in Switzerland. Engineer 119:397 Ap 23 '15

## Syria

Railway lines of Syria and Palestine. L: R. Freeman, il map Ry Age 59:199-203 Jl 30

## Turkey

Railway tunnel construction in Turkey. Ry R 57.546-7 O 30 '15

## United States

American engineering in 1914. Engineer 119: 164-5 F 12 '15 Commerce board presents steam-road sta-

164-5 F 12 15
Commerce board presents steam-road statistics. Eng Rec 71:453-4 Ap 10 '15
Construction and improvements for 1915. Ry R 56:30-3, 55 Ja 2-9 '15
Disintegration of the Gould system. Ry Age 58:728-9 Ap 2 '15
Rail sections as one element in steam and electric traction. P. H. Dudley, diags Ger Elec R 17:1036-46 N '14; Same, Sci Am S 78 362-3, 370-1 D 5-12 '14
Railroad statistics to June 30 1914 By Age

Solve Apr 9 '15

Railroads as a factor in our national life. H Elliott. Ry Age 59:96-7 Jl 16 '15 Railway construction in 1914. Ry Age 58:3 Ja

Railway construction in 1914. Ry R 56:27-30 J:

Railway construction statistics for 1914. Ry Ag 58:23-7 Ja 1 '15 Railway preparedness. O. Bates. Ry R 57:82-Jl 17 '15

Aniway preparedness. C. Bates. Ry R 97.322 Ji 17 '15
Railway situation from different viewpoints Ry Age 58:7-14 Ja 1 '15
Railways and the California expositions. Ry Age 59:461-4 S 10 '15
Rivers and railroads in the United States W: W. Harts. Ry Age 58:230-1 F 5 '15; Discussion. F. Lavis. Ry R 56:660-2 My 1 '15; Same cond. Ry Age 58:975-6 My 7 '15
Statistics of steam railways in the United States for the year ended June 30, 1914. R R 56:502-4 Ap 10 '15
Statistics of steam railways; Interstate commerce commission gives comparative figure for the years 1913 and 1914. Elec Ry J 41 '755 Ap 17 '15
Talk optimism, act optimism! Ry R 55:772-4 26 '14

Railroads-United States-Continued

Trend of railway affairs in two eight-year periods. Ry Age 59:N5-6 Jl 16 '15 28th annual report of the Interstate commerce commission. Ry R 56:159-64 Ja 30 '15 War capacity of United States railways. R. Grimshaw, Sci Am 112:417+ My 1 '15

Sec also Railroads and state-United States; also names of railroads, e. g. Great Northern railway; Van Buren bridge route

## Utah

Bingham and Garfield railway—a short road in Utah with some unusual features. H. C. Goodrich. il diag maps W Soc E J 20:512-29

Construction of new line to reach Utah fields, il map Ry Age 58:971-3 My 7 '1

Railroads, Cable. See Cable railroads

Railroads, Elevated. See Elevated railroads

Railroads, Elevated. See Elevated railroads
Railroads, Industrial
Car-pullers for switching at industrial plants.
Eng N 74:299 Ag 12 '15
Centrally controlled electric haulage systems.
F. E. Woodford, il Eng Soc W Pa 31:584-97;
Discussion, 31:598-608 O '15
Clinton mine switch, il Eng & Min J 100:309
Ag 21 '15
Maximum use of industrial railway possible
at low cost. F. Tarrant, Eng Rec 71:653-4
My 22 '15
Methods and costs of building a macada-

at low cost, F. Tarrant, Eng Rec 71:653-4 My 22 '15
Methods and costs of building a macadam road using an industrial railway. R. P. Mason, il Eng & Contr 43:322-3 Ap 7 '15
Operating Shay locomotives in winter. F. M. Leland, il Eng & Min J 99:729-30 Ap 24 '15
Plans for the Hetch-Hetchy construction railroad. Eng N 74:925 N 11 '15
Portable track crossings in a contractor's yard, il Eng N 74:317 Ag 12 '15
Proposed legislation against industrial railroads. Iron Age 95:313 F 4 '15
Road building with industrial equipment: twelve-car train hauled by a 20-horsepower dinkey, il Eng Rec 70:621 D 5 '14
Safety around surface tracks. Eng & Min J 99:279-80 F 6 '15
Safety in care and use of industrial railways, diag Foundry 43:105-6 Mr '15; Same, Ind Eng 15:73-5 Ag '15; Same cond. Eng M 48:603-5 Ja '15

Standard-gage railroad to haul road materials. il Eng Rec 72:393 S 25 '15
Two important commerce commission decisions; industrial railways and car spotting charges. Ry Age 59:99-102 Jl 16 '15

Locomotives, Industrial; See also roads, Portable

Railroads, Narrow gage
High capacity narrow-gauge rolling
il diags Engineer 120:200-1 Ag 27 '15

Railroads, Portable Portable railway ortable railway in highway construction, il Good Roads n s 9:180-1 My 1 '15

Railroads, Suspended. See Suspended railways

Railroads and state

Extent of government ownership. Ry Age 59: 3-4 Jl 2 '15

3-4 Jl 2 '15
Governmental regulation of railroads. O. W. Underwood. Ry R 56:563-5 Ap 24 '15
Relations of the railways and the public. L. E. Johnson. Ry Age 59:895-8 N 12 '15; Same cond. Ry R 57:625-8 N 13 '15
Ripley on railroads: finance and organization. W. M. Acworth. Ry Age 58:1144-5 Je 4 '15
Transportation in Europe; objections to government ownership in the United States. A. Stucki. Ry R 56:6-9 Ja 2 '15

Stucki, Ry R 50.0-7 54 See also Electric railroads and state; Interstate con roads—Rates

## Canada

Bitter lesson in government railroad building; the National transcontinental railway. Eng Rec 71:478-9 Ap 17 '15

## Great Britain

English experiment in railroading. Ry Age 58: 379 F 26 '15 Prospects of state ownership in England, W. M. Acworth. Ry Age 58:47-8 Ja 8 '15

India

Status of Indian railways. V: Bayley. Ry Age 59:599-608 O 1 '15

## United States

Address before International railway fuel association. A. M. Schoyer. Ry Age 58:1054 My

Commission on relations between railways and waterways. Ry Age 58:1037-8 My 21 '15 Federal regulation of railroads—a suggestion;

division of the country into districts. J. G. Code. Ry Age 58:1239-40 Je 11 '15 From a New York investment banker's point of view. A. B. Leach. Ry Age 58:10-12 Ja 1

of view. A. B. Leach. Ky Age 58:10-12 Ja 1 '15
Government regulation of railway operation. S: O. Dunn. Ry Age 58:184-7 Ja 29 '15
How can railroad regulation be strengthened?
A. J. County. Ry R 57:681-2 N 27 '15
Interstate commerce commission and its work.
E. E. Clark. Ry Age 59:493-6 S 17 '15; Same.
Eng & Contr 44:273-6 O 6 '15; Excerpts (Changes in the Interstate commerce law)
Ry R 57:400-3 S 25 '15
Interstate commerce commission refuses to decide international jurisdiction. Ry R 56: d65-6 My 15 '15
Is criticism of present railway regulation justifiable? Ry Age 57:1073-4 D 11 '14
Obsolete and conflicting railroad laws should give way to uniform Federal regulation.
H: W. Wack. Am Ind 15:18-19 My '15
Progress toward wiser railway regulation.
Eng N 73:450-1 Mr 4 '15
Public regulation of wages of railway employees. F. H. Dixon. Ry Age 58:929-32 Ap 30 '15

Railroad crisis: a way out [a railroad department with a cabinet officer]. R. Morris. Ry Age 58:743-4 Ap 2 '15

Age 58:743-4 Ap 2 '15
Railroad nationalization; plan for regional railroad companies controlled by the government. W: W. Cook. Eng M 49:411-14 Je '15
Railroads and the public—a national problem.
D. Willard. Ry Age 58:703-6 Mr 26 '15;
Same cond. Ry R 56:440-2 Mr 27 '15; Same
cond. Eng M 49:262-5 My '15
Railroads lose lake lines. Iron Age 95:1146 My
20 '15

20'15
Railroads must divorce lake steamship lines, map Ry R 56:682-5 My 22'15
Railroads need protection as well as regulation, E. H. Lee, Eng Rec 71:121 Ja 23'15
Railway problem a statesman's opportunity, F. Harrison, Ry Age 57:1075-8 D 11'14;
Same cond. Ry R 55:725-6 D 12'14
Railway problem and its solution. S: Rea. lty Age 57:1081-30 lt 11 1; Same. Ry R 55:720-2 D 12'14
Railway service—is it a national problem or a local issue? F. Trumbull, Ry R 57:582-4 N 6'15

Railway troubles due to lack of public under-standing. W. G. Harding. Ry Age 57:1114-16 D 18 '14

D 18 '14
Railways must abandon control of boat lines on the Great Lakes; abstract of the Interstate commerce commission's decision. Ry Age 58:1046-7 My 21 '15
Reasons for the unpopularity of railroads. A. M. Schoyer. Ry Age 57:1053-4 D 4 '14
Regulation is vexation. J. M. Davis. Ry R 57: 298-9 S 4 '15
Southern Pacific may operate steamship lines

Southern Pacific may operate steamship lines

to Balboa, Ry R 50:234-5 F 22 State and the railroads, H. R. Kurrie, Ry Age 58:1252-3 Je 11 '15 State governor demands return to sanity in legislation, F. B. Willis, Ry R 56:322-3 Mr

Unsuccessful regulation. W. G. Harding. Ry R 55:724-5 D 12 '14

What is the matter with the railroads? E. Stenger. Ry Age 59:203-4 Jl 30 '15 Whither are the railways drifting? J. Kruttschnitt. Ry Age 58:7 Ja 1 '15

See also Interstate commerce commission

Railroads in war

Achievements of the state railway lines of Germany. W. M. Acworth. Ry Age 59:725 O

Battle of the Marne. W. S. Hiatt. Ry Age 59: 26-8 JI 2 '15; Abstract. Eng M 50:108-9 O '15

Railroads in war-Continued

Country's railroads and national defense; with discussion. G: D. Snyder. Ry Age 59:1017-18 N 26 '15; Abstract. Ry R 57:685-6 N 27 '15 France saved by her railroad men. W. S. Hiatt. Ry Age 58:1047-8 My 21 '15 French railways in war time. Ry Age 58:1422-

Germany's strategic railways. V: Cambon. maps Eng M 49:93-6 Ap '15
Great achievements of German state railroad lines. F: W: Wile. Ry Age 59:428-30 S 3 '15; Same. Sci Am S 80:218-19 O 2 '15
Preparedness in transportation. L: Bell. Elec Ry J 46:1086 N 27 '15
Railroad soldier at the front. W. S. Hiatt. Ry Age 59:811-12 O 29 '15
Steam or electric railways in time of war. Engineer 119:142 F 5 '15
See also. Hospital cars: Hospital trains:

See also Hospital cars; Hospital trains; also Railroads—France

Rails

Alloy-steel rails. Eng N 72:1111-12 D 3 '14 Australia now producing steel rails. map Ry R 56:813-14 Je 12 '15

Bureau of standards and railroads confer. Iron

Bureau of standards and railroads confer. Iron Age 95:122N-9 Je 3 '15 Cold straightening of rails. R. W. Hunt. Ry Age 59:726 O 22 '15 Curving rail with power bender. diags Ry Age 57:1142 D 18 '14 Effect of finishing temperatures of rails on their physical properties and microstructure. W. R. Shimer. il Am Inst Min E Bul 99:557-85 Mr '15; Same. Iron Age 95:394-7 F 18 '15; Same. Iron Tr R 56:379-82 F 18 '15; Discussion, Am Inst Min E Bul 101:1107-11 My '15

Effect of titanium alloys on steel. G: F. Comstock, il Iron Tr R 57:391-5+ Ag 26 '15 Electric rail grinder. il Sci Am 113:49+ Jl 10

Essential qualities of good steel rails. G. Lindenthal. diags Ry R 57:83-9 Jl 17 '15; Same cond. Ry Age 59:187-90 Jl 30 '15; Abstract. Eng M 49:579 Jl '15; Abstract. Eng M 20:106-8; Discussion. 72:108-9 Jl 24 '15 Experimental 125-pound rail of the Pennsylvania railroad. diags Ry R 56:431 Mr 27 '15 Finishing temperatures and properties of rails. G: K. Burgess and others. U S Burstand Tech Pa 38:1-63 '14; Summaries. Am Inst Min E Bul 93:2433-7 S '14; Iron Age 94:24-5 Jl 2 '14; Ry Age 56:1592-3 Je 26 '14; J Fr Inst 178:101-3 Jl '14; Sci Am 111:94 Ag 8 '14; Met & Chem Eng 12:594 S '14; Iron Tr R 55:641-4 O 1 '14; Iron Age 94:837 O 8 '14; Discussion. Iron Age 94:893-4 O 15 '14; Discussion. Am Inst Min E Bul 100:767-87 Ap '15

Ap '15
Gages for measuring rail wear. A. R. Bailey.
diags Elec Ry J 46:1042 N 20 '15
Girder and high T-rail renewals. A. Swartz;
C. L. Hawkins. Elec Ry J 46:4040-1 S 4 '15
Girder and high T-rail renewals. D. P. Falconer. Elec Ry J 46:829-31 O 16 '15
Girder and high T-rail renewals. E. M. Haas.
diags Elec Ry J 46:179-84 JI 31 '15
Girder and high T-rail renewals. E: P. Burch.
Elec Ry J 46:276 Ag 14 '15
Girder and high T-rail renewals. G: L. Wilson;
E. P. Roundey. Elec Ry J 46:592-3 S 18 '15
Girder and high T-rail renewals. W. F. Graves;
R. C. Cram. Elec Ry J 46:872-3 O 23 '15
Good rails and sound ingots. Iron Age 95:406

Good rails and sound ingots. Iron Age 95:406 F 18 '15

Has titanium any influence on the properties of steel? F. A. J. FitzGerald. diags Met & Chem Eng 13:28-9 Ja '15; Same cond. Iron Age 95:309 F 4 '15; Summary. Elec Ry J 45:98 Ja 9 '15

High carbon 135-lb. rail. Iron Age 95:673 Mr 25 '15

History of the U-rail section, diags Eng N 74:  $^{34}$  Jl  $^{1}$   $^{15}$ 

Improving the quality of steel rails for heavy traffic. Eng N 73:1047 My 27 '15

Inclination of the rail in economic railroad practice. J: Lundie. Ry Age 59:335-6 Ag 20

Influence of carbon on the properties of rails. Ry Age 57:1196 D 25'14

Life of way structure as affected by engineer-

Life of way structure as affected by engineering and municipal conditions. P. N. Wilsondiags Elec Ry J 45:1212-13 Je 26 '15
Making sound steel commercially. E: F. Kenney. il diags Iron Tr R 57:349-55+, 897-400
Ag 19-26 '15; Same (pt 2). Iron Age 95:1343-6 Je 17 '15; Discussion. H: M. Howe. Iron Tr R 57:400+ Ag 26 '15
Manganese-steel rails. R. Hadfield. il Engineer 118:564 D 11 '14
Mechanical elimination of seams in steel

Manganese-steel rails. R. Hadfield. il Engineer 118:564 D 11 '14

Mechanical elimination of seams in steel products, notably steel rails. R. W. Hunt. Iron Age 94:1334-7 D 10 '14; Same. Iron Tr R 55:1073-6 D 10 '14; Same. Sci Am S 79: 100-1 F 13 '15; Same cond. Eng N 72:1228-31 D 17 '14; Same cond. Eng Rec 70:636 D 12 '14; Same cond. Ry R 56:85-8 Ja 16 '15; Same cond. Eng M 48:755-7 F '15; Abstract. Am Soc M E J 37:152-3 Mr '15; Discussion. Iron Age 94: 1337-8 D 10 '14; Discussion. Am Soc M E J 37:153-6 Mr '15

New heavy rail section. diag Eng N 73:1042-4 My 27 '15

New rail sections. diag Iron Age 95:870 Ap 15

New rail sections, diag Iron Age 95:870 Ap 15

N'15
N'15
Eng N 73:664-5 Ap 8 '15
9-in. grooved rail for M. C. B. fianges. diag
Elec Ry J 46:369-70 Ag 28 '15
159-pound girder rail for Philadelphia streets.
diag Eng Rec 72:254 Ag 28 '15
Pointers on rail mill practice. E. Standiford.
Iron Tr R 57:307-9+ Ag 12 '15
Poor quality of heavy steel rails. Eng N 74:
34-5 Jl 1 '15
Production of rails in the United States in

roor quality of heavy steel rails. Eng N 74: 34-5 Jl 1'15
Production of rails in the United States in 1914. Ry Age 58:846 Ap 16'15
Rail committee presents six new rail sections. diag Eng Rec 71:392 Mr 27'15
Rail sections as one element in steam and electric traction. P. H. Dudley, diags Gen Elec R 17:1036-46 N '14; Same. Sci Am S 78: 362-3, 370-1 D 5-12'14
Railroads place orders with Canadian company. Iron Tr R 56:542-3, 578-80 Mr 18'15
Railways and the steel companies. Ry Age 55:682 Mr 26'15
Relation of wheel coning to rails and tie plates. W. M. Osborn. Ry R 56:337-9 Mr 13'15
Signal, bonding and contact rail notes on the Northwestern Pacific. F. T. Vanatta. il Elec Ry J 46:539-41 S 18'15
Sound steel for rails and structural purposes. R. A. Hadfield, il J Fr Inst 179:119-40, 663-80 F, Je'15
Sound steel ingots and rails. G: K. Burgess

F, Je '15
Sound steel ingots and rails. G: K. Burgess and R. A. Hadfield. il Am Inst Min E Bul 98:455-68 F '15; Same. Iron Age 95:346-8 F 11 '15; Same. Iron Tr R 56:369-72 F 18 '15; Same cond. Ry R 56:362-4 Mr 13 '15; Abstract. Engineer 119:494 My 14 '15; Discussion. Am Inst Min E Bul 101:1112-15 My '15; Discussion. Engineer 119:501-2 My 21 '15; Discussion. Met & Chem Eng 13:445-6 JI

Special railway track for Philadelphia streets, diags Eng N 74:129 N 11 '15
Special steels for track work, W. C. Cushing, Ry Age 59:747-51 O 22 '15; Abstracts, Eng Rec 72:317 S 11 '15; Iron Age 96:692 S 23 '15; Elec Ry J 46:878-9 O 23 '15
Steel-rail puzzle, Eng N 74:84-5 J1 8 '15

Suggestions regarding the determination of the properties of steel. A. N. Mitinsky. Am Inst Min E Bul 104:1697-1705 Ag '15; Abstract. Iron Age 96:462-3 Ag 26 '15; Same cond. (Proportional limit is prime factor) Iron Tr R 57:1184-6 D 16 '15; Discussion. Am Inst Min E Bul 108:2481-95 D '15

Titanium and its effects on steel. G: F. C stock. il J Ind & Eng Chem 7:93-4 F Same cond. Sci Am S 80:327 N 20 '15

Two heavy rail sections, diag Eng N 74:761 C 14 '15

United States rail production. Eng & Min J 99:683 Ap 17 '15

Vanadium steel rails of 105-lb, section, D. L & W. R. R. il Ry R 56:249-51 F 20 '15; Sum-mary, Ry Age 58:332 F 19 '15

See also Guard rails; Rail bonds; Rai fastenings; Rail handling; Rail joints; Rail roads—Track; Spikes (railroad)

#### Rails -Continued

Corrugation

Corrugation of rails in electric railway service. Ry Age 58:1449 Je 18 '15
Differential gears to eliminate rail corrugation. il diag Elec Ry J 46:26-7 Jl 3 '15
Harder rails suggested as preventative of corrugation. S. P. W. D'A. Sellon. Elec Ry J 45:578 Mr 20 '15 45:578 Mr

Wear and corrugation of rails. Engineer 119: 428 Ap 30 '15

## Failures

Conclusions from steel rail research. Iron Age 95:622-3 Mr 18 '15
Rsil failures and train accidents. Eng N 72: 1160-1 D 10 '14

1160-1 D 10 '14
Rail failures show decrease since 1908. M. H.
Wickhorst. Iron Tr R 57:1034 N 25 '15
Rail injuries from gagging. P. H. Dudley.
Iron Age 95:700 Mr 25 '15
Rails and rail failures in relation to train accidents. Eng N 72:1177-8 D 10 '14
Transverse fissures the result of rail gagging.
P. H. Dudley. il Ry Age 59:1001-4 N 26 '15
Typical rail failures: abstract. F. A. Weymouth. Am Soc M E J 37:57 Ja '15

#### Lubrication

Lubricating rails on curves to reduce wear. Eng N 73:475 Mr 11 '15

#### Specifications

Constructive work leading to better rail specifications urgently needed. Eng Rec 72:8-10

JI 3 '15
Foreign rail, wheel and axle specifications. Iron Age 96:52-4 Jl 1 '15
New specifications for rails; Pennsylvania R. R. system. Eng N 74:397 Ag 26 '15
Pennsylvania's 1915 rail specifications. diags Ry Age 59:165-7 Jl 23 '15; Same. Iron Tr R 57:744-6 O 14 '15
Rail steel and rail breakages. A. W. Gibbs. Ry R 57:147-9 Jl 31 '15; Same (Working out great problems). Iron Tr R 56:1333-4 Je 24 '15; Same cond. Iron Age 96:30-1 Jl 1 '15; Same cond. Ry Age 59:17-19 Jl 2 '15

## Stresses

Experimental determination of stresses in track. C. C. Williams. il Ry Age 59:121-2 Jl

J. E. Howard, Eng N 74:855 O 28 '15 Lateral stresses in rails on straight track, G; L. Fowler, diag Ry Age 58:1231-8 Je 11

Lateral stresses on rails in curved tracks. G: L. Fowler, il Ry Age 59:319-22 Ag 20 '15

## Testing

Comparative service tests of 100-pound sections, P. S. and A. R. A.—A rails on the Pennsylvania lines. W. C. Cushing. Ry Age 57:1078 D 11 '14

Age 57:10(8 D 11 12)
Finishing temperatures of rails; American society for testing materials committee report. Iron 'Tr R 56:1307-9 Je 24 '15; Same. Ry R 57:201-3 Ag 14 '15; Same cond. Iron Age 96:19-21 Jl 1 '15; Excerpts. Ry Age 59: 64-5 Jl 9 '15
Novel tests for rail steel. Elec Ry J 46:454 S

Test of vanadium rails, il Elec Ry J 45:388 F 20 '15; Iron Age 95:398 F 18 '15

Rails. Guard. See Guard rails

Railway association, American. See American railway association

Railway bridge and building association, American. See American railway bridge and building association

Railway business association Resolutions adopted, Dec. 20, 1914. Ry Age 57:1128 D 18 '14

Railway commissioners, National association of. See National association of railway commissioners

Railway development association Semi-annual meeting, New York, Nov. 9-11. Ry Age 59:909-12, 938-9 N 12-19 '15

Railway electrical engineers, Association of See Association of railway electrical engineers

Railway fire protection association 2d annual meeting, Chicago, Oct. 5-7. Ry Age 59:691-4 O 15 '15

Railway fuel association, International. See International railway fuel association

Railway general foremen's association, Inter-national. See International railway general foremen's association

Railway mail service

Railway mail service

Efficiency in the post office department. Ry
Age 57:1110-11 D 18 '14

Government money to go by mail at expense
of railroads. Ry Age 59:389-90 Ag 27 '15;
Same. Ry R 57:273-4 Ag 28 '15

Government view of government management.
Ry Age 59:351-3 S 24 '15

Hupp automatic mail exchange system. il diags
Ry R 57:436-40 O 2 '15

Mail pay controversy. Ry Age 58:712 Mr 26 '15

Merchants' association of New York condemns
mail pay as unfair. Ry R 57:555-6 O 30 '15

New England roads file claims for mail pay
losses. Ry Age 59:164 Jl 23 '15

Western association of short line railroads.
Ry Age 58:58 Ja 8 '15

See 48s Electric railway mail service

See also Electric railway mail service

Railway master mechanics' association, American. See American railway master mechanics' association

Railway perishable freight association, can. See American freight association railway

Railway real estate association 1st annual meeting, Chicago, Oct. 13-14. Ry Age 59:727-9 O 22 '15

Age 59:727-9 O 22 '15

Railway signal association
Meeting, New York city, May 26-27. Elec Ry
J 45:1023-4 My 29 '15

Railway signal association manual. A. G.
Shaver. Ry R 56:835-7 Je 26 '15

Spring meeting, Chicago, March 15. Ry R 56:
408-11 Mr 20 '15
20th annual convention, Salt Lake City, Sept.
14-16. Elec Ry J 46:580-1 S 18 '15
20th annual convention, Salt Lake City, Sept.
14-16. Ry Age 59:561-3 S 24 '15
20th annual convention, Salt Lake City, Sept.
14-16. Ry Age 59:561-3 S 24 '15
20th annual convention, Salt Lake City, Sept.
14-16. Ry R 57:405-6 S 25 '15
Winter meeting, Chicago, March 15. Elec Ry
J 45:582-3 Mr 20 '15

Railway storekeepers' association

Railway storekeepers' association

allway storekeepers' association 12th annual convention. Chicago, May 17-20. Ry Age 58:1039-46, 1125-6 My 21-28 '15 12th annual convention, Chicago, May 17-20. Ry Age (Mech ed) 89:285-90 Je '15 12th annual convention, Chicago, May 17-20. Ry R 56:688-93 My 22 '15

Railway telegraph superintendents, Association of. See Association of railway telegraph superintendents

Railway tool foremen's association, American. See American railway tool foremen's association

Railways. See Railroads

Railways, Suspended. See Suspended railways

Rain and rainfall

Average rainfall in the light of the New Bedford record. N. M. Stineman. Eng N 73:1213

Je 24 '15
Cincinnati rainfall averages. H. R. Crohurst.
Eng N 74:783 O 21 '15
Cycles of rainfall and the new Bedford records.
D. M. Wood. Eng N 72:1321-2 D 31 '14
Day's rainfall of over 15 in. in St. Petersburg,
Fla. Eng N 74:28-9 Ag 26 '15
Determination of rainfall rates, Pawtucket,
J. 1. G: A. Carpenter. il Eng N 74:148-9
J. 1. 22 '15

Electricity of rain; abstract. G. C. Simpson. Elec W 66:251 Jl 31 '15

Erie rainstorm and flood, il map Eng N 74: 326-9 Ag 12 '15

Extraordinary rain in St. Louis with study of runoff. W. W. Horner. Eng N 74:742-3 O 14 '15

Havana rainfall records. F. M. Aguirre. Eng N 74:830 O 28 '15

Rain and rainfall -Continued

ain and rainfall—Continucal
Intensity of rainfall studied at Columbus, Ohio.
C: Herrick. Eng N 74:678-9 O 7 '15
Long-term rainfall records in New York state.
E: H. Surgent. Eng N 74:103 Ag 26 '15
Meteorological analysis of storm indicates similarity to hurricane of 1900. map Eng Rec 72:275-6 Ag 28 '15
New Orleans record for succession of storms broken. map Eng Rec 72:562-3 N 6 '15
Relative reliability of long-time rainfall observations, F. H. Millard. Eng N 73:1212 Je 24 '15

Restricted stream channel responsible for Erie flood damage. T. E. Seelye. il Eng Rec 72: Run-off from sewered areas: 502

un-off from sewered areas; final report of committee, bibliog il diags Boston Soc C E J 1:291-382 Je '14; Abstract, Munic J 37:73-4 Jl 16 '14

Sewage measurement and automatic control of storm overflow at Pawtucket, R. I. G: A. Carpenter. il diags Boston Soc C E J 1:419-27 O '14

See also Rain water pipes; also New Orleans—Hurricane, 1915

Rain water pipes
Rain water leaders. E. R. Porter. diags Dom
Eng 73:230-1, 262-3 N 20-27 '15

iclined walkways replace stairs and elevators in new Victor building at Camden, N. J. il plans Eng Rec 72:656-7 N 27 '15

Rand mines. See Gold mines and mining-Trans-

Range finders

ange finders
Getting the range: instruments which make gun fire effective at distances up to ten miles. il Sci Am 112:220-2 Mr 6 '15
Range-finder: how distances are measured on the battlefield. il Sci Am S 80:20 J1 10 '15
Rangefinders. diag Sci Am S 79:28 Ja 9 '15
Science in the war and after the war. J. A. Fleming. Sci Am S 80:338-9 N 27 '15

Range finding Accuracy of gun fire. H. J. Jones. Engineer 120:239-40 S 10 '15

Rapid transit

Autos and the electric car. J: A. Beeler. Elec Ry J 46:590-2 S 18 '15

Consideration with regard to the rapid transit problem in cities, G: F. Swain. Eng Soc W Pa 31:239-54 Ap '15

See also Electric railroads; Elevated railroads; Railroads; Street railroads; Subways

Rare earths. See Earths, Rare

Logging Rasak and Lagan. T. R. Helms, il Am For 21:1050-3 N '15

Rat proofing

Concrete a plague-eradicator in New Orleans. H. P. Letton. Eng Rec 71:325-6 Mr 13 '15

Rates

Reasons for different rates. Power 41:383, 684-5 Mr 16, My 18 '15

See also Electric power—Rates; Gas rates; Prices; Public service corporations—Rates; Water rates

Rattan

Rattan supply of the Philippines. J: R. Arnold. US Bur For & Dom Com 95:1-40 '15

Ray Consolidated copper company, Ray, Arizona Report for 1914. Eng & Min J 99:707-8 Ap 17

Underground mining systems, L. A. Blackner, il diags Am Inst Min E Bul 102:1249-90 Je '15

Razing. See Wrecking

Reactance coils

Current-limiting reactors. W. H. Dann and H. H. Rudd. Power 42:244-5 Ag 17 '15

Discussion on reactance by American institute of electrical engineers. Am Inst E E Pro 34:1309-22 Je '15

Fireproof current-limiting reactors, il Elec  $\stackrel{\cdot}{\mathrm{W}}$  66:376 Ag 14 '15

Laboratory-built reactance of large capacity.
il Elec R & W Elec'n 67:944-5 N 20 '15

Location for current-limiting reactors. Elec W 64:1159-60 D 12 '14

Protective reactance coils. il diags Elec W 65:945-9 Ap 10 '15

Reactions, Chemical. See Chemical reaction Reagents, Chemical, See Chemical reagents

Appraisal of city real estate. W: E. Davies. Eng & Contr 43:167-70 F 24 '15 See also Property

Real estate association, F real estate association Railway. See Railway

Real estate association

Real estate business

Community stupidity; how real-estate promotion creates congestion and reduces values. plans F: L. Ackerman. Am Inst Arch J 3: 193-7 My '15

Coöperation of the real-estate developer and town-planner in land subdivision. P. A. Harsch. Am Inst Arch J 3:308-10 Jl '15

## Accounting

Real estate subdivisions. S. Walton. J Account 19:320-4 Ap '15

Real property. See Real estate

Reamers

Heavy duty electric reamer. il Ry Age (Mech ed) 89:199 Ap '15 Portable pipe-reaming machine. il Power 42: 123 Jl 27 '15

Rebates of duties. See Drawbacks

Receipts. See Chemistry, Technical; Red fire

Reclamation of land

Construction methods and plant for diversion and drainage works for Little River drain-age district in Missouri. Eng Rec 70:612-14 D 5 '14

San Diego, Cal. L. R. W. Allison. Eng & Contr 44:95-6 Ag 4 '15 Cost to the U. S. reclamation service of draining over-irrigated lands. Eng & Contr 43:2 Ja 6 '15

Ja 6 '15
Neponset river reclamation. W. B. Conant. il
Munic J 39:254-5 Ag 19 '15
River improvement for public health reclaims
10,000 acres of fertile land. R. W. Sherman.
il map Eng Rec 71:738-9 Je 12 '15
Simple construction reclaims 7000 acres of
rich land at low cost, Pitt Meadows, B. C.
H. M. Burwell. il diag map Eng Rec 72:330-1
S 11 '15

See also Drainage; Irrigation

Reclamation service (United States)
Changed reclamation service. Eng Rec 72:125
Jl 31 '15

JI 31 '15 Changed reclamation service again. Eng Rec 72:671-2 N 27 '15 Electrical features of the U. S. reclamation service. F. H. Newell. Am Inst E E Pro 33:1583-98 O '14; Summary. Elec W 64:753 O 17 '14; Discussion. Am Inst E E Pro 34: 675-9 Ap '15

673-9 Ap '15 Multiple-arch diversion dam at Three Miles Falls, Oregon. H. D. Newell. il diag Eng N 73:1009-12 My 27 '15 One year's work of the U. S. reclamation service. Eng Rec 70:648 D 12 '14 Reclamation service has unique library. Eng N 74:787 O 21 '15

74:787 O 21 '15 Shall the irrigation settlers be given relief? Eng Rec 72:650-1 N 27 '15

Suggested itinerary for engineers desiring to visit reclamation service projects. Eng N 73:363-4 F 18 '15

Uncle Sam in the movies. C. J. Blanchard. il Am For 21:532-40 Ap '15

Recorders

Coasting recorders in New York, il Elec Ry J 45:572-5 Mr 20 '15

Electrical long distance transmitting, lectrical long distance transmitting, indicating and recording system, il diags Ind. Eng 14:395-6 O '14; Colliery 35:281-2 D '14; Heat & Ven 11:57-9 D '14; Mach 21:330-1 D '14; Met & Chem Eng 12:797-8 D '14; Eng N 72:1136-7 D 3 '14; Elec R & W Elec'n 65:1100-1 D 5 '14; Power 40:916-17 D 29 '14

Graphic recorder for the Cole pitometer, i diags Eng N 73:875 My 6 '15

Recorders -Continued

ecorders — Continued

Machine-tool performance diagnosis: lessons
of the power-time characteristic and value of
automatic records on analyzing productive
operations. Elec W 65:417-18 F 13 '15

New type of flow recorder, il Heat & Ven 12:
52-3 Ag '15

Panama-Pacific exposition. F. R. Low. il Pow-

Panama-Pacific exposition, F. R. Low, il Power 42:444-7 S 28 '15
Protection and control of industrial electric power. C: P. Steinmetz, il Gen Elec R 18: 983-5 O '15
Recorder for passenger-mile earnings, il Elec Ry J 45:948-9 My 15 '15
Recording power plant operations. J. C. Smallwood, il diags Eng M 49:818-36; 50:33-46, 262-75, 382-9 S-D '15
Records of radio time signals made with a physiological recorder. C. W. Waggengr, il

wood, it digs Eng M 49.816-30, 30.33-40, 202-75, 382-9 S-D '15
Receives of radio time signals made with a physiological recorder. C. W. Waggoner, il Sei Am S 70:152 Mr 6 '15 Speed control on dreadnought Pennsylvania, il Int Marine Eng 20:200-1 My '15

See also Carbon dioxide recorders; Temperature recorders

Records

Card record of employees. C. E. Fairbanks. Eng M 48:573-5 Ja '15

Card record of employees, S. G. Koon. Eng M 49:88-90 Ap '15 Checking freight charges, P. A. Smith, Iron Age [65:666 Mr. 4 15]

Age 95:036 Mr 4 15
Convenient operating reports for steam plants.
Elec W 65:1623-6 Je 19 '15
Electrical repair record system; methods of
National tube co. J; F. Kelly. Iron Tr R 56:
1064-7 My 27 '15; Same cond. Iron Age 95:
1070 My 13 '15; Discussion. Iron Tr R 56:
1067-9 My 27 '15
Estimate record blanks in the

1070 My 13 '15; Discussion, Iron Age 95: 1067-9 My 27 '15
Estimate record blanks in book form. Metal Work 83:201 Ja 29 '15
Export price records. H. A. Russell, Iron Age 95:1114-15 N 11 '15
How to use statistics in management, F. G. Coburn, Eng M 49:717-23 Ag '15
Keep record of electrical repairs, G. E. Stoltz, Iron Tr R 56:967-9+ My 13 '15; Same cond. (Steel mill electric motors) Iron Age 95:952-3
Ap 29 '15
Log sheets at Delray station M.

Ap 29 10 Log sheets at Delray station, N. G. Reinecker, Power 42:482-4 O 5 '15 Method of recording and filing information concerning bids received and bidders. Eng & Contr 44:92 Ag 4 '15

Model record of distribution of coplant, il Eng N 74:218-19 Jl 29 '15

Modern plating department order system. C: H. Fleischer. Metal Ind n s 13:151-2 Ap '15

Office methods for the electrical contractor. Elec R & W Elec'n 66:550-2 Mr 20 '15

Record forms for the electrical contractor. Elec R & W Elec'n 66:724-5 Ap 17 '15

Record keeping in the power plant. S. J. H. White. Power 41:243-4 F 16 '15

Recording power plant operations: the records; combining, averaging, integrating, and filing; special planimeters. J. C. Smallwood. il Eng M 50:382-9 D '15

Records for the purchasing department. H. A. Russell. Iron Age 96:308-9 Ag 5 '15

Springfield water-works, il Eng N 74:443-5 S 2

ystems for the engineer and contractor. T: Barwick, Heat & Ven 11:27-34 N; 15-21 D '14: 12:18-22 Ja '15 Systems

See also Electric railroads-Records; Foundry records; Railroads—Records; Street rail-roads—Records

Records, Municipal. See Municipal records

Recreation buildings

Chicago municipal pier. il diags Eng N 74: 193-7 Jl 29 '15

Frame building heated by warm air system. M. H. Ressler. il plans Metal Work 84:400-1 M. H. R S 24 '15

Recreation centers. See Social centers

Rectangular pressure vessels. H. J. Vander Eb. Locomotive 30:164-9 Ap '15

Rectifiers, Electric current. See Electric current rectifiers

Red Cliff, Colorado
Geology and ore deposits of Red Cliff, Colorado. A. H. Means. il Econ Geol 10:1-27 Ja
'15

Red fire

Good mixture for red fire, G: B. Jackson, Sci Am 113:291 O 2 '15 Safe red fire mixture, Sci Am 113:161 Ag 21

Red gum Use of native woods for interior finish. C. M. Price. il Brickb 24:221-2 S '15

Reduction, Chemical

Rate of reduction of mercuric chloride by sodium formate. G. A. Linhart. Am Chem Soc J 37:70-6 Ja '15

um formate, G. A. Finnert, Am constant 37:70-6 Ja '15 Reduction of copper oxide in alcohol vapor in reducing sugar determinations and copper analysis. A. Wedderburn, J Ind & Eng Chem 7:610-11 Jl '15

Redwood

Features of the home of redwood. J. H. Browne. il Bldg Age 37:36-40 Ag '15 Use of native woods for interior finish. C. M. Price. il Brickb 24:285 N '15

Reflection (light)
Air shaft illumination as studied by models.
C. H. Sharp. Illum Eng Soc 9:598-610 no 7 '14
Diffusing media; papers and inks. Illum Eng
Soc 10:379-87 no 5 '15
Mixed specular and diffuse reflection; with discussion. P. G. Nutting. Illum Eng Soc 9:
571-8 no 7 '14

Reflection from painted surfaces. L: Bell. Elec W 65:211-12 Ja 23 '15; Same. Am Gas Light J 102:91 F 8 '15; Same cond. Ind Eng 15:

Tests of some possible reflecting power standards. P. G. Nutting, L. A. Jones and F. A. Elliott. Illum Eng Soc 9:593-7 no 7 '14
Window envelopes. Illum Eng Soc 10:394-6 no

Reflectors

Bowl-type metal reflectors, il Elec R & W Elec'n 67:634 O 2 '15 New developments in the projection of light, L. C. Porter, il Illum Eng Soc 10:38-54 no 1

Parabolic ashestos reflector. il Elec R & W Elec'n 67:440 S 4 '15 Prismatic-glass window reflector. il Elec R & W Elec'n 67:440-1 S 4 '15 Silvered-mirror reflectors for flood lighting. diags Elec W 66:825 O 9 '15 See also Light projection

Reforestation. See Forest planting

Refraction

Refractometry, G. A. Shook, Met & Chem Eng 12:572-6, 630-5; 13:19-22 S-O '14, Ja '15 Refractometer

Refractometry, G. A. Shook, Met & Chem Eng 12:572-6, 630-5; 13:19-22 S-O '14, Ja '15

12:572-6, 630-5; 13:19-22 S-O '14, Ja '15
Refractory materials
Carborundum products, their manufacture and uses as abrasives and refractories. C. E. Hawke. Iron Age 96:1121 N 11 '15
Difference between English and German refractory materials. A. B. Searle. Am Gas Light J 103:268-9 0 25 '15
Refractories of the Rocky mountain region, and some of their products. J. C. Bailar. il Met & Chem Eng 13:257-8 Ap '15
Refractory materials and the war. A. B. Searle. Sci Am S 79:169 Mr 13 '15
Selecting refractories for the foundry: ab-

Selecting refractories for the foundry: abstracts, W. H. Kelley. Iron Age 94:942-3 O 22 '14; Ind Eng 14:469-71 D '14

Thermal conductivity of refractories. B. Ducley, jr. Met & Chem Eng 13:315-16 My '15

Thermal insulation of high-temperature equipment. P. A. Boeck, diags Am Inst Min E Bul 104:1539-50 Ag '15; Excerpts. Iron Age 96:335-4 Ag 12 '15; Sci Am S 80:315 N 13 '15; Discussion. Am Inst Min E Bul 108:2513-19

Zirconia, a new refractory, H. C. Meyer, il Met & Chem Eng 12:791-3; 13:263-6 D '14, Ap '15

See also Fire brick; Ganister; Magnesite; Silundum

Refrigerating engineers, American society of. See American society of refrigerating engineers

Refrigeration and refrigerating machinery Ammonia a heat vehicle. A. Johnson. Power 41717 My 15-747 Same. Set Am. 8 8055 Jl 24 Applications of congealed brine. R. L. Ship-

Applications of congealed brine, K. L. Shipman, Power 42:222-3 Ag 17 '15
Automatically operating refrigerating apparatus autofrigor; abstract. P. Ostertag, diag Am Soc M E J 37:479-80 Ag '15
Blast-furnace plant auxiliaries and general arrangement; dry blast. J. E. Johnson, jr. diags Met & Chem Eng 13:429-39 Jl '15
Cald air refrigeration plant, Power 42:674 N 16

Cold-air refrigeration plant. Power 42:674 N 16

Columbus refrigerating plants, il Power 42:

Compressor trouble due to throttled suction line. T: G. Thurston. diag Power 41:274 F 23

Decomposition of ammonia and the chances of explosions, F. L. Fairbanks, Power 42:715-17

Design, construction and operation of a 1000-ton ammonia compression refrigerating ma-chine. F. L. Fairbanks. diag Am Soc M E J 37:560-1 S '15

37:560-1 S '15
Detecting ammonia leaks, C. E. Anderson.
Power 40:851-2 D 15 '14
Detecting ammonia leaks, T: G. Thurston.
Power 41:101 Ja 19 '15
Don'ts for refrigerating engineers, T: G.
Thurston. Power 41:607-9 My 4 '15
Electricity in a cold-storage plant, il Elec R & W Elec'n 67:357-9 Ag 28 '15
Electricity in a wholesale grocery establishment, il Elec R & W Elec'n 67:503-6 S 18

English mechanical engineers' refrigeration report. Power 40:828-9 D 8 '14
Equipment and methods in largest refrigeration system: Quincy market cold storage & warehouse co., Boston. C: H. Bromley. il Power 40:798-802, 843-4, 878-83, 914-16; 41:9-14 D 8 '14-Ja 5' 15
Experiences of refrigerating troubleman. C. E. Anderson. diags Power 42:330-1 S 7' 15
Experiences of refrigerating troubleman. T: G. Thurston. Power 42:521-2 O 12' 15
Frost 16 feet deep found under refrigerator plant. J. N. Jensen. il Eng Rec 72:297 S 4' 15

Getting capacity in the refrigerating plant.
A. G. Solomon. Power 41:802-3 Je 15 '15
How electricity is used in handling seafood. il
Elec W 66:450-1 Ag 28 '15
Inconspicuous losses in refrigerating plants.
P: Neff. Power 41:778 Je 8 '15
Initial charge with anhydrous. H. G. Gibson.
Power 42:681 N 16 '15
Large electrically operated refrigerating machine, il Elec W 65:1204-5 My 8 '15
Mechanical refrigeration in manufactures.
C. E. Lucke. J Ind & Eng Chem 7:462-3 Je '15

New Morrison hotel plant, Chicago. T: Wilson, il Power 42:111-12 Jl 27 '15 Oil troubles experienced in the refrigeration system. A. G. Solomon. Power 42:234-5 Ag

Operating a refrigerating plant. T: G. Thurston. Power 42:185-6 Ag 10 '15
Operating variable temperature refrigeration system. A. L. Rice. Power 42:709-10 N 23 '15 Overhauling the refrigeration plant, F. E. Matthews. Power 42:579-80, 606-8 O 26-N 2 '15

Power requirements of ammonia compressors. W. N. McKee. Power 41:158-60 F 2 '15

Practical use of thermometers in refrigerating plants. P: Neff. Power 42:417-18 S 21 '15

Refrigerating engineers meet. Power 40:866-7

Refrigeration by gas. H. M. Soper. Am Gas Light J 102:412-13 Je 28 '15 Refrigeration in France. L. Marchis. Power 42:528-9 O 12 '15

Refrigeration night, Chicago section, A. S. M. E. Power 41:489-91 Ap 6 '15

Removing scale from ammonia condensers. A. G. Solomon. Power 42:84-5 Jl 20 '15

Similar features of boiler and refrigeration systems, T: G. Thurston, Power 42:437-8 S

Standard in refrigeration. L. A. Simmons. Gen Elec R 18:1171-2 D '15 Suggestions on overhauling a refrigeration plant. T: G. Thurston. Power 41:328-9 Mr

Survey of the refrigeration field as it exists today. H. I. Holleman. Gen Elec R 18:65-7 Ja '15

See also Ammonia compressors; Cold storage; Cooling; Ice—Manufacture; Refrigerator cars Cost

Electrical refrigeration at 11.7 cents a day. il Elec W 65:1202 My 8 '15 Initial and operating costs of refrigeration plants. R. P. Kehoe. Power 41:710-11 My 25 '15

Laws and regulations

Massachusetts ammonia safety regulations. F. L. Fairbanks, diags Power 42:753-6 N 30

ew York's refrigeration ordinance. Power 42:68 Jl 13 '15

Regulations governing refrigerants in New York city. Power 40:862 D 15 '14

Safety devices

Operating refrigeration plants safely. H. W. Geare. diag Power 41:307-8 Mr 2 '15 Geare. diag Power 41:307-8 Mr 2 '15 Safety in handling refrigerants. A. G. Solo-mon. Power 41:170-1 F 2 '15 Safety in refrigerating plants. Power 41:679-80 My 18 '15

See also Refrigeration-Laws and regula-

Testing

Air testing in the refrigeration plant. A. G. Solomon. Power 41:839-40 Je 22 '15
Performance of refrigeration plant at Lubeck,
Germany. R: Stetfeld. Power 41:212-14 F 9
'15

Refrigeration in transportation Refrigerating plant on the first American steamer to bring frozen and chilled meats from the Argentine, il diags Int Marine Eng 20:150-1 Ap '15

See also Refrigerator cars

Refrigerator cars Baltimore & Ohio milk refrigerator car. il diags Ry Age (Mech.ed) 88:621-3 D '14 Detroit United builds refrigerator car. C. L. Keller. il diag Elec Ry J 46:1044 N 20 '15

Refrigerators

Measurements for the household. U S Bur Stand Circ 55:50-3 '15 Refrigerator wastes and connections. J. Graham. diags Dom Eng 73:36-7 O 2 '15

Refuse, Utilization of Fertilizer from municipal waste. J. W. Tur-rentine. Munic J 39:739-40 N 11 '15 Making fuel out of garbage. W. D. Hornaday. il Munic Eng 48:304-5 My '15

Refuse and refuse disposal Akron is building sewage and garbage disposal plants, plan Eng Rec 71:63 Ja 9 '15
Analysis of Chicago refuse. Munic J 38:314-15

Analysis of Chicago refuse. Mumic J 38:314-19 Mr 1: 15
Atlanta burns its garbage for 91 cents per ton, E. R. Conant. Eng Rec 72:532 O 30 '15
Disposal of garbage and refuse in Seattle. Munic Eng 48:118-19 F '15
District sanitary disposal plant. F. Spiegelburg, il Sci Am S 80:300 N 6 '15
Emergency garbage disposal in Chicago. G: B. Young. il Eng Rec 70:666-7 D 19 '14
Experiences in refuse collection and disposal with reference to odors. S: A. Greeley. Eng & Contr 42:576 D 23 '14
Garbage and refuse disposal and experiences with incineration at San Francisco. A. J. Cleary. il nlan Eng N 73:301-4 F 1N '15
Garbage collection and incineration in Sewickley, Pa. E: E. Duff, jr. il Munic J 30:719-22 N 11 '15
Garbage disposal at Reading. W. C. Matthias. il diag Munic J 39:544-5 O 7 '15
Garbage-disposal propositions at San Francisco. Eng N 74:232 Jl 29 '15

Refuse and refuse disposal—Continued

Method and cost of collecting and incinerating garbage at Racine, Wis. P. H. Connolly.
Eng & Contr 44:211-12 S 15 '15

Milwaukee bureau of street sanitation. Munic
J 37:888-90 D 17 '14

Prevention of odors at city refuse disposal
works, R. Hering, Eng & Contr 43:81-2 Ja
27 '15

Recent refuse disposal practice, with list of reduction plants in the United States. W: F. Morse. Munic J 37:848-51 D 10 '14; Abstract. Eng N 73:575-6 Mr 25 '15

Eng N 73:575-6 Mr 25 '15
Refuse collection and disposal, E. N. Stacy, il
Assn Eng Soc J 54:12-34 Ja '15
Refuse collection and disposal; information
from several hundred cities concerning methods and costs. Munic J 39:722-39 N 11 '15
Refuse disposal at Savannah, E. R. Conant.
Munic J 38:136-8 F 11 '15
Summer municipal wastes: Chicago street department makes analyses, Eng Rec '71:84-5
Ja 16 '15

See also Refuse collection; Refuse incinerators; Sewage; Sewage disposal; Street cleaning; Trade waste; Waste products; Waste removal; Water pollution

## Reduction plants

City and state power plants at Columbus, Ohio. T: Wilson. il Power 42:323-4 S 7 '15 Cobwell garbage-reduction process. Eng N 72: 1249 D 24 '14 Data concerning reduction plants; tabulation. Munic J 39:734 N 11 '15 Essential features in the design and operation of prefuse disposal plants I S Osborn. Eng

of refuse disposal plants. I. S. Osborn. Eng & Contr 44:166 S 1 '15

Garbage and rubbish disposal in Los Angeles. S. C. Simons. il plan Munic J 38:799-803 Je 10 '15

Garbage reduction at Columbus, Ohio, 1913 and 1914. Eng N 73:1030 My 27 '15

Garbage reduction in Columbus. il Munic J 39:846-7 D 2 '15

Investigations on the nature and elimination of odors and dust from a garbage reduction plant. H. W. Mahr and A. C. Kraft, il diags J Ind & Eng Chem 7:778-85 S '15; Abstract. Eng N 74:547 S 16 '15

Municipal garbage-reduction plant, Schenec-tady, N. Y. S. Gertz. il plan Eng N 73:820-2 Ap 29 '15

New methods of odor elimination at garbage plants indicated by New York tests. I. S. Osborn. Eng Rec 72:16-17 Jl 3 '15

Operations of the Cleveland garbage-reduc-tion works. Eng N 73:527 Mr 18 15

Recent refuse disposal practice, with list of reduction plants in the United States, W: F. Morse. Munic J 37:848-51 D 10 '14; Abstract. Eng N 73:575-6 Mr 25 '15 Reduction of New York's garbage. il map Munic J 39:35-9 Jl 8 '15

Success of two municipal garbage-reduction plants. Eng N 73:1042 My 27 '15

Refuse collection

Collecting ashes and garbage in Passaic, N. J. A. Reid. Munic J 38:35-6 Ja 14 '15

Garbage and refuse collection and disposal in St. Louis, Mo. Munic Eng 48:340-1 Je '15

Garbage collection and incineration at Norfolk, Va. W: R. Russell, il diags Munic J 38:183-5 F 11 '15

Garbage collection and incineration in Sewick-ley, Pa. E: E. Duff, jr. il Munic J 39:719-22 N 11 '15

Garbage collection in a small city. L heim. il Munic J 38:36-7 Ja 14 '15

Garbage collection studies in Chicago justify continued use of horses. Eng Rec 72:52-3 Jl of municipal refuse. L: L. Tribus. Munic Haul

J 39:190 Ag 5 '15

Method and cost of refuse collection and disposal in Los Angeles, Cal. A. C. Hansen. Eng & Contr 44:255-6 S 29 '15

Refuse collection and disposal. E. N. Stacy. il Assn Eng Soc J 54:12-34 Ja '15

Refuse collection and disposal; information from several hundred cities concerning methods and costs. Munic J 39:722-39, 812-14 N 11, 25 '15; Correction. 39:846 D 2 '15 Refuse collection in Chicago. Munic J 39:841-2 D 2 '15

Refuse disposal in Richmond, J. W. Cloey, il Munic J 38:166-8 Ap × 15
Refuse dumped from the cart to scow without scattering, il Eng Rec 72:315-16 S 11

Sanitary method of garbage collection. W: H. McLain. il Munic Eng 49:61-2 Ag '15
Street cleaning appliances: exhibits at the New York street cleaning department exhibition. il Munic J 37:858-66 D 10 '14

See also Refuse receptacles

### Cost

Cost

Cost of collection and method of disposal; tabulation. Munic J 39:728-30 N 11 '15

Costs of collecting, hauling, transferring and transporting municipal refuse. S: A. Greeley. Eng & Contr 42:376-7 O 21 '14

Differences in cost of refuse collection. Munic J 39:845-6 D 2 '15

Extent and cost of use of motor trucks in municipal refuse collection service. S: A. Greeley. Eng & Contr 44:286-7 O 13 '15

New York street cleaning. il Munic J 39:842-4 D 2 '15

Refuse incinerators

All-steel el refuse incinerator, Roanoke, Va. Woodman, il diags Eng N 73:678-80 Ap J. C. 8 '15

Data concerning incinerators; tabulation, Munic J 39:733-4 N 11 '15
Design and operation features of refuse destructors. R. O. Wynne-Robert. Eng & Contr 42:501-3 N 25 '14
Design and operation of small municipal refuse incinerator at International Falls, Minn. E. W. Kibbey. diags Eng & Contr 43:477-8 My 26 '15
Electricity from refuse destructors; abstract.

My 26 '15

Electricity from refuse destructors; abstract.
A. J. Abraham. Elec W 66:651 S 18 '15

Garbage and refuse disposal and experiences
with incineration at San Francisco. A. J.
Cleary. il plan Eng N 73:301-4 F 18 '15

Garbage and refuse incinerator at Palo Alto,
Calif. N. H. McKay. plans Eng N 73:432-3

Mr 4 '15

Carbage and refuse incinerator at Palo Alto,
Calif. N. H. McKay. plans Eng N 73:432-3

arbage and rubbish incinerator recom-mended for Albany, N. Y. Eng N 73:565 Mr

Garbage collection and incineration at Norfolk, Va. W: R. Russell. il diags Munic J 38: 183-5 F 11 '15

183-5 F 11 '15 Garbage disposal at Reading, W. C. Matthias, il diag Munic J 39:544-5 O 7 '15 Incinerators for small towns, il Munic J 37: 845-6 D 10 '14

List of destructor installations constructed between 1906 and 1914, inclusive. Munic J 37: 849 D 10 '14

Refuse collection and disposal, E. N. Stacy, il Assn Eng Soc J 54:12-34 Ja '15

Refuse destructor at Savannah, Ga Conant. il Munic Eng 47:416-23 D stract. Eng N 73:256-8 F 11 '15 Ga. E. Ab-

Refuse incinerator at Petersburg, il plan Munic J 38:311-13 Mr 11 '15

Refuse incinerator at Portland, Ore. W: G. Helber. Munic J 39:774-5 N 18 '15

Refuse incinerator, Florence, S. C. M. Maf-fitt, il diag Eng N 73:1166-7 Je 17 '15

Refuse incinerator guarantees are too strict for practical fulfilment. Eng Rec 71:777 Je 19 '15

San Francisco rejects completed garbage incinerator. Eng Rec 70:sup275-6 D 5 '14

Seattle's refuse destructors; reasons for discontinuing the use of one of them. Munic J 39:40-1 Jl 8 '15

Six types of construction camp garbage and refuse incinerators, diags Eng & Contr 44: 163-5 S 1 '15

Refuse receptacles

Requirements for refuse receptacles; materials and sizes specified by several score of cities. Munic J 39:780-1 N 18 '15

## Regina, Saskatchewan

Water supply

Design, construction and cost of new water works reservoir at Regina, R. O. Wynne-Roberts, il diags Eng & Contr 43:285-7 Mr

Reindeer r. Grenfell's missions in Labrador, H. H. Heath, il Inland Ptr 55:53-4 Ap '15

Reinforced concrete. See Concrete, Reinforced Reinforcing bars, Steel. See Steel reinforcing bars

Relativity

Developments in electromagnetism. E. Bloch. Sci Am S 79:338-9 My 29 '15

Relays
Automatic device for timing relay and fuse operation, plan Elec W 65:608-9 Mr 6 '15
General Electric compensator type relay, il Ry R 57:544 O 23 '15; Elec R & W Elec'n 67:734 O 16 '15; Iron Age 96:921 O 21 '15; Iron Tr R 57:895 N 4 '15; Power 42:680-1 N 16 '15
Installation of reverse-energy relays, A. R. Haynes, diags Elec W 65:221-2 Ja 23 '15
Photoelectric relay, J. Kunz, diag Elec W 66: 934 O 23 '15
Recent developments in switchboard apparage.

934 O 23 '15
Recent developments in switchboard apparatus. E. H. Beckert. il diag Gen Elec R 18: 646-7 Jl '15
Relay for protecting single a. c. tie lines. il diag Elec Ry J 46:599-600 S 18 '15
Selective time element of relays. P. MacGalan. diags Elec W 65:597-9 Mr 6 '15
Telegraph relays: abstract. H. W. Malcolm. diags Elec W 65:403-4 F 13 '15

Relief maps Great relief map of the Panama canal, il Eng

N 731237-X F N 15 Largest spherical relief map in the world: exhibit of the Denver & Rio Grande and affiliated railroads. il Sci Am 112:589 Je 12

Rensselaer polytechnic institute, Troy, N. Y. New buildings. il Eng N 74:475 S 2 '15

Rent

Distributing overhead expense. N. T. Ficker. Eng M 50:58-64 O '15 Rents in public utility accounting. J: Bauer. J Account 20:21-7 Jl '15

See also Landlord and tenant

Repair ships Equipment of repair plant of U. S. S. Vestal. L. J. Connelly, il Metal Work 84:670-1 N 26

Floating foundry of the U. S. S. Vestal. F. M. Perkins, il plan Foundry 43:211-15 Je '15

Repair shops
Economic limit of the repair shop. V. W.
Berry. Elec Ry J 45:1027 My 29 '15
Electrical repair record system; methods of
National tube co. J: F. Kelly. Iron Tr R 56:
1065-7 My 27 '15; Same cond. Iron Age 95:
1070 My 13 '15; Discussion, Iron Tr R 56:

Homestead repair shops, il plan Iron Tr R 56:659-65 Ap 1 '15

Repair department a profitable side line. Metal Work 84:598 N 5 '15

Shops for repair purposes at Gary, il plan Iron Tr R 56:277-81+ F 4 '15

Steel plant repair system. B. D. Quarrie. Iron Age 94:1316-17 D 3 '14

See also Electric railroads—Shops; Min shops; Railroads—Sanitation; Railroads— Shops

Repair shops, Municipal Central plant at Chicago will handle repairs to all city equipment. il plan Eng Rec 72:266-7 Ag 28 '15

Chicago's municipal repair shop, C. C. Saner, il Munic Eng 48:289-91 My '15

Repairing

Emergency portable repair kit, il Power 42: 235-6 Ag 17 '15

See also Repair ships; Repair shops; also subhead Repair under various subjects, e. g. Boilers—Repair

Cub reporter, H. Gilmore, Inland Ptr 55:327-9 Je '15 Reporting

How a reporter won his spurs. J. T. Elliott. Inland Ptr 55:33-41 Ap '15

Reports, Engineering. See Engineering reports Reproduction

See also Fecundity; Parthenogenesis

Reptiles

Making natural history popular; attractive museum groups of our common pond reptiles. W. H. Miller. il Sci Am S 80:328-9 N 20 '15

Research, Chemical. See Chemical research Research, Industrial. See Industrial research Research, Medical. See Medical research

Research, Scientific. See Scientific research Research corporation

esearch corporation
Practical applications of electrical precipitation and progress of the Research corporation. L. Bradley, bibliog il Am Inst E E Pro 34:523-65 Ap '15

Resemblances. See Heredity

Reservoirs

eservoirs

Blanket versus cut-off wall for sealing bank at
Cedar river dam. D. C. Henny. Eng Rec
71:656-7 My 22 '15

Building the earth embankment for Hill View
reservoir. A. W. Tidd. il plan Eng N 74:500-5

Construction features of the North side reservoir of the water works of the city of Pittsburgh. E. E. Lanpher and J. S. Cole. il Eng Soc W Pa 30:669-86 O '14; Same. Eng & Contr 42:577-9 D '23 '14; Same cond. Munic J 38:558-62 Ap 22 '15; Discussion. Eng Soc W Pa 30:686-92 O '14 Cutoff-wall and rock grouting at the Milton reservoir embankment. il diags map Eng N 73:468-71 Mr 11 '15
Design and cost of new middle system reservoir, Duluth. Eng & Contr 43:318 Ap 7 '15
Design, construction and cost of new water works reservoir at Regina, Sask. R. O. Wynne-Roberts. il diags Eng & Contr 43: Evaporation and seepage from irrigation reservoir Mr 11 '15
Evaporation and seepage from irrigation reservoir Mr M. Henry il Eng. N. 51:304.

Wynne-Roperts, il diags Eng & Contr 43: 285-7 Mr 31 '15 Evaporation and seepage from irrigation reservoirs, K. A. Heron, il Eng N 74:294-5 Ag 12 '15

ervoirs. K. A. Heron. il Eng N 74:294-5 Ag 12 '15
Excavating and timbering the very deep trenches required in reservoir and other dam construction. J. M. M. Greig. plans Eng & Contr 44:176-8 S 8 '15
Hauling material on the North side reservoir, Pittsburgh. Eng N 73:173-4 Ja 28 '15
Improving Liberty, N. Y., water supply. H: W. Taylor. il Munic J 38:390-1 Mr 25 '15
Influence of reservoir bottoms on stored water. W. F. Smith. il Eng N 72:1289-92 D 31 '14
Leakage from Cedar lake reservoir, Seattle water-supply. C: E. Fowler. il map plan Eng N 73:112-15 Ja 21 '15
Nidd valley reservoir of Bradford, England, water works. il Munic Eng 48:170-1 Mr '15
Provo reservoir company's irrigation project. C. S. Jarvis. il Eng N 74:394-5 Ag 26 '15
Rectangular fire-service reservoir. W. G. Potter. il Eng Rec 71:280-1 F 27 '15
Relining a small bricklined water works reservoir with asphalt and concrete at Irwin, Pa. J: M. Rice. il diags Eng & Contr 43:273-4 Mr 24 '15
Repairing and waterproofing the Nashville water-works reservoir. W. W. Southgate. i diags Eng N 73:849-52 My 6 '15
Reservoir sites on the Colorado river. L: C Hill. map Eng Rec 70:670-1 D 19 '14
St. Maurice river storage project, Quebec. Eng & Contr 43:sup29-30 Je 16 '15
Seepage at Cedar river reservoir. Eng Rec 71 62 Ja 9 '15

Seepage at Cedar river reservoir. Eng Rec 71

62 Ja 9 '15

Solving the silt problem: reservoirs suggested for muddy streams of the Southwest, L: C Hill. Eng Rec 70:609-10 D 5 '14

Stripping water-works reservoirs. A. Hazand G: C. Whipple. Eng N 73:858-60 My '15

ripping water-works reservoirs. Stearns. Eng N 74:302-5 Ag 12 '15 Stripping See also Cisterns; Dams; Flood control; Ir rigation; Water supply Reservoirs, Concrete

eservoirs, Concrete
British practice in the design of reinforced concrete reservoirs. E. R. Matthews. Eng & Contr 42:519-20 D 2 '14
Concrete-lined oil storage reservoirs in California; construction methods and cost data; abstract. E. D. Cole, diag Eng & Contr 44: 408-9 N 24 '15

Construction methods used in building Parkersburg reservoir, L. E. Chapin, diags Eng Rec 72:140-1 Jl 31 '15 Construction of the Eden Park reservoir, Cincinnati, K. C. Crain, il Concrete Cem 6:134-5

Design and construction of the North side reservoir of the Pittsburgh water works, il diags plan Concrete Cem 6:227-31 My '15 Making concrete tight; Tacoma and Seattle water-works. C. E. Fowler. il Eng N 74:1076-

7 D 2 '15
Placing concrete in reservoir walls by compressed air, Montreal, il diag Eng N 73:122-3 Ja 21 '15

Placing concrete in wall and dam of water supply reservoir at Montreal by compressed air method, il diag Eng & Contr 43:138 F 10

Placing monolithic lining on reservoir bank. il Eng N 74:1034 N 25 '15 Two types of joint between walls and bottom of a reservoir diags Eng N 73:591 Mr 25 '15

Resins. See Gums and resins

Resistance to rolling of a hard body over a plastic surface, Theory of; abstract. B. B. Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S

Resoiling Resoiling dredged areas in Victoria. Eng & Min J 98:1136-7 D 26 '14

Resonance

Simple resonance experiment; abstract. O. Steels. diags Elec W 66:987-8 O 30 '15

Respiration. See Breathing

Restaurants

Restaurant lighting, F. L. Godinez, il Arch & Bldg 47:336-8 S '15 Typical restaurant plumbing system. G. D. Crain, jr. il plans Metal Work 82:727-9 D 4

See also Tea rooms and tea houses

Restaurants, Factory. See Factory restaurants Restraint of trade

Chicago electrical contractors and fixture men indicted for conspiracy in restraint of trade. Elec R & W Elec'n 66:826-7 My 1 '15 Federal court ruling in the Des Moines case. Dom Eng 71:161-2 My 8 '15

See also Monopolies; Trusts, Industrial

Retaining walls Construction of the Barge canal crossing of Oak Orchard creek. E. Low. il diags Eng N 73:430-2 Mr 4 '15
Log retaining-wall. F: W. Foote, il Eng & Min J 100:394 S 4 '15

Min J 100:394 S 4 '15
Reinforced brickwork retaining wall, diags
Engineer 120:10 Jl 2 '15
Retaining walls on soft foundations. W. S.
Lacher, il diags W Soc E J 20:232-47 Mr
'15; Same cond. Eng & Contr 48:576-9 Je 30
'15; Abstract. Ry Age 58:411-13 Mr 5 '15;
Discussion. W Soc E J 20:247-65 Mr '15
Temporary timber walls for track elevation. il
Eng Rec 71:646 My 22 '15

Retaining walls, Concrete

ctaining walls, Concrete

Concerning the relative costs of plain and reinforced concrete retaining walls. J. I. Oberlander. Eng & Contr 43:457 My 19 '15

Concrete-block and cellular retaining walls.
W. S. Lacher. il diags Eng N 73:1048-9 My 27 '15

Concerte

Concrete retaining wall spans cut for sub-ways undercrossing, il Eng Rec 72:642 N 20

Design methods in concrete construction—retaining walls. S. M. Cotten. diags Concrete Cem 7:63-7 Ag '15

esigning of reinforced concrete retaining walls by comparison with the determined ratios of the various functions of the height and unit pressures. S. M. Cotten. Eng & Contr 42:146-8 Ag 12 '14 Designing of reinforced

Enlarging an old concrete retaining-wall along

Enlarging an old concrete retaining-wall along the White Plains road extension. G: Paaswell. il diags Eng N 74:508-9 S 9 '15 Expansion joints in concrete structures. diags Ry R 57:628-30 N 13 '15; Abstract. Eng Rec 72:532 O 30 '15 From the soil up—a new method of designing. A. Reuterdahl, diags Eng & Contr 42: 581-5 D 23 '14; Same cond. Eng M 48:740-2 F '15

F '15 High concrete retaining wall with structural reinforcing, il diags Eng N 73:776-7 Ap 22 '15

High retaining walls of cantilever type for viaduct in St. Louis, S. W. Bowen, diag Eng Rec 72:109 Jl 24 '15 Light frames support reinforcement for high retaining wall, il diag Eng Rec 72:56 Jl 10

London county hall. diags Engineer 120:147-8 Ag 13 '15

Ag 13 '15 Nearness of railway tracks aids concreting of retaining walls. K. C. Cardwell. il Eng Rec 72:269-70 Ag 28 '15 New method used in constructing the retain-ing walls of the Lumber exchange building, Chicago. diags Eng & Contr 42:362-3 O 14

New quaywall at Southampton, England. diag Eng N 73:1221 Je 24 '15
Patented cantilever vs. gravity retaining walls. diag Eng N 73:1088 Je 3 '15
Plant and working methods on approaches to North side Point bridge. E. L. Jones. il diag Eng N 72:1124-6 D 3 '14
Retaining wall to support Butler st., near Baker st., Pittsburgh. diags Concrete Cem 5:242-3 D '14
Stepped concrete river wall at Harrisburg, Penn. J. D. Justin. il diag Eng N 74:145-8 JJ 22 '15

Returnable packages

Accounting for cement packages. G. Wilson. J Account 19:198-205 Mr '15

Revenue cutters New United ew United States revenue cutte plans Int Marine Eng 20:4-7 Ja '15 cutters. diags

Reverberatory furnaces. See Furnaces, Metallurgical

Rewards, prizes, etc. Prizes for scientists. Sci Am S 80:228 O 9 '15

Rheims cathedral

Rheims cathedral. L. Brachet. il Am Inst Arch J 3:14-15 Ja '15

Rheostats

High-voltage water rheostat. L. I. Clark. il diags Elec W 65:669-70 Mr 13 '15 Large water rheostats. diag Elec W 65:41-2 Ja

New types of Ward Leonard resistors. il Elec R & W Elec'n 65:1098-9 D 5'14 Sliding-contact tube rheostats, il Elec W 66:

660 S 18 Water rheostats. N. L. Rea. diag Gen Elec R 18:1001-3 O '15

See also Electric controllers; Electric resistance

Richards, Joseph William, 1864-Sketch. por Eng M  $_{\circ}50:204$ -5 N '15

Richmond, Va.

# Architecture

Thomas Jefferson and the first monument of the classical revival in America. F. Kimball, il Am Inst Arch J 3:370-81 S '15

Riddles

Portable riddle of novel design, il Iron Tr R 57:832 O 28 '15

Rifle practice. See Target practice

Rifle ranges

Electric remote gages for shooting ranges. Sci Am 112:633+ Je 26 '15 Lighting of rifle ranges. il Elec R & W Elec'n 67:372 Ag 28 '15 Lighting of rifle ranges. A. P. Trotter and others. il diags Illum Engr 8:251-81 Je '15 Model target ranges in Belgium. Sci Am S 79:165 Mr 13 '15

Cincinnati rifle barrel grinding machine. diags Mach 22:250-1 N '15

Rifles --Continued

European iniantryman's rifle, E: C. Crossman, il Sci Am 112:398-9 My 1 '15
Rifle and its bullet, H. L. Heussner, il diags
Sci Am S 80:268-9 O 23 '15
Rifles and mortars, il diags Sci Am 111:472-3
D 5 '14

elescope sights for fighting rifles. E: Crossman. 1l Sci Am 113:118-19 Ag 7 '15 Telescope

Rights of way
Location and width of highways and the securing of rights-of-way. A. B. Fletcher.
Eng & Contr 42:523-4 D 2 '14; Same cond.
Eng Rec 70:568 N 21 '14
United States mining statutes annotated;
rights of way. J. W. Thompson. U S Bur
Mines Bul 94:pt 2, 1188-93 '15

Rignoux, Georges Telephotographic apparatus of Georges Rig-noux, R. Arapu, diag Sci Am S 79:331 My

Riker, Andrew L., 1868-Sketch. por Eng M 50:220-1 N '15

Ripley, Edward Payson, 1845-Celebration of seventieth birthday. por Ry R 57:578-86 N 6 '15 Dinner to E. P. Ripley on seventieth birthday. por Ry Age 59:849-53 N 5 '15

Ripple marks. See Seashore

Riprapping Earth embankment and fill at Shopton, Iowa. il plan Eng N 72:1172-3 D 10 '14

Rittman, Walter F Government publicity methods. W. O. Snelling. Met & Chem Eng 13:272-3 My '15; Excerpt. Eng & Min J 59:787-8 My 1 '15

Rittman process. See Gasoline

River traffic Facilities for shipping and freight handling at river ports. E. E. R. Tratman. Int Marine Eng 20:115 Mr '15 River traffic in the United States. Ry R 56: 164 Ja 30 '15

Rivers and railroads in the United States. W: W. Harts, Ry Age 58:230-1 F 5 '15
Snag boats on flood rivers. D. A. Willey, il Sci Am S 79:149 Mr 6 '15
Transportation of débris by running water.
R. T. Hancock, Eng & Min J 99:459-60 Mr 6 '15

Why rivers overflow: how floods may be prevented. A. E. Morgan. il diags Sci Am S 78: 392-4 D 19 '14

See also Dams: Floods: Hydraulics; Mining débris; River traffic; Stream flow; Stream measurement; Valleys; Water pollution; Water power; Waterways

# Pollution

See Water pollution

ombination concrete pavement and board mattress bank protection, il Eng & Contr 44:271 O 6 '15 Combination

44:271 O 6 7b
Cost data on the work of improving the Neponset river in Massachusetts, E. M. Blake, il Eng & Contr 43:34-6 Ja 13 75
How \$30,000,000 is to be spent; allotment of appropriation to government river and harbor projects. Eng & Contr 43:sup24 Ap 14

"15
Illinois waterway—proposed eight foot channel from Lockport to Utica, map Eng & Contr 43:201 Mr 3 '15
Improvement of the river Trent, map Engineer 119:130-1 F 5 '15
Lumber mattresses for bank protection, J. W. Skelly, Eng Rec 71:276 F 27 '15
Lumber mattresses for bank protection in Louisiana, il Eng Rec 70:688 D 26 '14
Methods of creating and maintaining channels at mouths of fluvial and tidal rivers, E. L. Corthell, Eng Rec 71:42 Ja 9 '15
Missouri river improvement work may be stopped, H. Deakyne, Eng N 74:409 Ag 26

Neponset river reclamation. W. B. Conant. il Munic J 39:254-5 Ag 19 '15 Paving river-beds with concrete. il Sci Am 113:362+ O 23 '15

Plan for the improvement of Hell Gate, East river. C. D. Ward, map Sci Am 112:432 My 8 '15

Plastic concrete mattress for river revetment, il diags Eng N 74:262-3 Ag 5 '15
Protecting valuable river, lands in California, E. F. Comstock, il diag Eng N 73:827 Ap 29 '15

River-front improvement at Cape Girardeau, Mo. il Eng N 73:874-5 My 6 '15 River improvement for public health reclaims 10,000 acres of fertile land. R. W. Sherman. il map Eng Rec 71:738-9 Je 12 '15 Solving the silt problem: reservoirs suggested for muddy streams of the Southwest. L: C. Hill. Eng Rec 70:609-10 D 5 '14 Stepped concrete river wall at Harrisburg, Penn. J. D. Justin. il diag Eng N 74:145-8 Jl 22 '15

Wire and rock mattress to protest bridge pier. J. H. Fisk. Eng N 74:986 N 18 '15 See also Channels; Flood control; Missis-

sippi river

Rivers and harbors congress, National. See National rivers and harbors congress

Riverside, New York

#### Bridges

few B. R. & P. structure across Allegheny river at Riverside. il diag Ry Age 58:845-6 Ap 16 '15

Riveting

iveting
Behavior of riveted joints under stresses:
abstracts. J. E. Howard. Int Marine Eng 20:
18-19 Ja. '15; Power 41:216 F 9 '15
Combination rivet set. H. L. Loucks. diag Ry
Age (Mech ed) 89:251 My '15
Diagram for net section of riveted tension
members. T. A. Smith. Eng N 73:893 My 6

'15
Eccentric rivet connections. C: D. Conklin, jr.
Eng Rec 71:58 Ja 9 '15
Eccentric rivet connections. J: C. Prior. Eng
Rec 71:212 F 13 '15
Hanna riveting machine. il Ry Age (Mech ed)
89:547 O '15; Eng Rec 72:775 D 18 '15; Mach
22:347 D '15
Machine which heats and drives rivets il

Machine which heats and drives rivets. il Iron Age 95:937-8 Ap 29 '15 Methods of jointing aluminum. il Mach 21:471-2 F '15

2 F '15 100-ton pneumatic riveting hammer. il Iror Age 95:795 Ap 8 '15 Riveting in steel car construction. H. A. Hat-field. il diags Ry Age (Mech ed) 89:33-6, 87-90 Ja-F '15

Safe eccentric loading of rivets. J. Di Stasio Sch Mines Q 35:213-22 Ap '14; Excerpt. Eng & Contr 42:512 D 2 '14

Rivets

Authorities against rivet-tension. Eng N 74 183-5 Jl 22 '15 Rivets in tension. V. H. Poss. Eng N 74:60 S 23 '15

Tension rivets successful. Eng N 74:347 Apr 19 '15

Tools for making a double-pronged rivet. i diags Mach 21:299 D '14

Rivett, Joseph P.
Rivett flong machine. A. W. Birdsall. il po
Inland Ptr 55:95-6 Ap '15

Road administration. See Highway administra tion Road builders' association, American. See Amer

ican road builders' association Road congress, Pan-American. See Pan-Ameri

can road congress

Road drags Construction and use of the wooden road drag il diags Eng & Contr 42:213-15 Ag 26 '14 Road foundations. See Pavements-Foundations

Roads-Foundations Road laws. See Highway law Road making machinery Austin ripper and Western grader, il Munic 39:375 S 2 '15

Brick road on machine-leveled subgrade. En Rec 71:209 F 13 '15

Development of the road paving plant, il Mun Eng 47:479-81 D'14

Road making machinery—Continued Grading machine loads nine two-yard wagons in ten minutes, il Munic Eng 49:124-5 S '15 Guaranteed traction grader, il Eng & Contr 44:97-8 Ag 4 '15

Hetherington road building plant, il Munic J

37:815 D 3 '14 Hints on selecting machinery for road building. Eng Rec 71:151 Ja 30 '15 Location and construction of highways in mountain country. F. W. Harris, il Eng N 72:1200-1 D 17 '14; Same (Bagley scraper for road making). Eng & Min J 99:325 F 13

Machinery for construction and maintenance. T. R. Agg. Good Roads n s 9:21-4 Ja 2 '15; Same. Eng & Contr 43:156-8 F 17 '15 Maney four-wheel scraper. Il Munic Eng 49: 125-6 S '15 Operation analysis of new machines which cheapen the moving of earth on road work. A. B. McDaniel. il Eng Rec 72:126-8 Jl 3l '15 Portable drilling rig on road and street work—performance records in cutting trenches and cleaning reservoirs. il Munic Eng 49: 123-4 S '15 Power road machinery with special reference.

Power road machinery with special reference to hauling and earth road grading. N. De Wind. il Eng & Contr 43:83-5 Ja 27 '15 Road and street exhibits at the Panama-Pacific international exposition. il Good Roads n s 10:154-9 S 4 '15

n s 10:154-9 S 4 '15 Road planer, grader and ditcher. il Good Roads n s 9:80-1 F 6 '15 Road scarifier. il Good Roads n s 9:80 F 6 '15 Scarifier attachment for Austin road graders. il Eng & Contr 44:55 Jl 21 '15 Sixth Good roads show, Chicago, Dec. 14-18. il Good Roads n s 9:30-7 Ja 2 '15

See also Paving machinery; Road drags; Road rollers Road maps

Sixth volume added to Blue books. maps Automobile 32:596-9 Ap 1 '15 Road materials

toad materials

Asphaltic materials for road construction.

A. A. Berkowitz. Eng & Contr 42:161-3 Ag
12 '14; Same. Munic Eng 47:464-7 D' '14

Bituminous road construction; committee report to Am. Soc. C. E. Munic J 38:286-8 Mr
4 '15; Same. Eng & Contr 43:278-80 Mr 24

4 '15; Same. Eng & Contr 43:278-80 Mr 24 '15; Development of refined tars for use in road construction and maintenance. P. P. Sharples. Met & Chem Eng 13:918-20 D 1 '15
Investigation of the concrete road-making properties of Minnesota stone and gravel. C: F. Shoop. il Minn U Bul 2:1-55 '15
Methods of sampling materials of construction used by the New York highway commission. Eng & Contr 42:158-60 Ag 12 '14
Practical testing of asphalt and road oil. T. A. Fitch. Eng & Contr 44:367-9 N 10 '15
Proposed standard definitions of road and pavement materials. Munic Eng 49:76 Ag '15
Proposed standard terms for bituminous road materials. Eng & Contr 42:234-5 S 2 '14
Proposed standard tests of bituminous road materials. Eng N 73:187 Ja 28 '15
Sixth Good roads show, Chicago, Dec. 14-18. il Good Roads n s 9:30-7 Ja 2 '15
State-wide survey locates road-making ma-

State-wide survey locates road-making terials in New York. Eng Rec 71:488-9

See also Bituminous materials; Concrete; Gravel; Road oils

oad oilers

Motor truck for oiling roadways. F. Reed. il Munic Eng 47:442-4 D '14 Road oiler developed to meet California con-ditions. il Eng Rec 72:362 S 18 '15 oad oils

Device evice tests adhesiveness of California road oils. il Eng Rec 71:329 Mr 13 '15

Practical testing of asphalt and road oil. T. A. Fitch. Eng & Contr 44:367-9 N 10 '15

Progress reports of experiments in dust prevention and road preservation, 1914. U S Agric Bul 257:1-44 '15

Road oil test for loss on heating needs revision. N. Chivvis. diags Eng Rec 72:570-6 N 6 '15

Road rollers

Cheap and effective backfilling with a road roller, B. A. Heinly, il Eng N 73:941 My 13

Electrically-driven road roller at St. Louis. il Elec Ry J 44:1355 D 19 '14 Twelve-ton oil-propelled road roller. il Engi-neer 119:212 F 26 '15

Road signs

Color schemes for highway signs as illustrated by practice in the Philippine Islands. J. L. Harrison. il diags Eng & Contr 44:280-1 O

Concrete sign boards for highways, W: M. Kinney, Concrete Cem 7:32 Jl '15 Concrete street signs and standards—letters in colored concrete, il diag Concrete Cem 7:

45 Jl '15 County road signs placed in 1915. Munic Eng 48:270 Ap '15

Road surveys. See Roads-Location

Road traffic

oad traffic

Segregation and analysis of local traffic: a neglected factor in traffic recording on country roads. Eng & Contr 42:283 S 23 '14

Traffic; present tendencies, probable development and regulation. A. W. Dean, Good Roads no \$9:55-6 F 6 '15

Value of a traffic census in determining the type of road to be constructed. W: W. Marr. Eng & Contr 44:369-70 N 10 '15

Roadmasters' and maintenance of way association

33d annual convention, Chicago, Sept. 7-10. Ry Age 59:517-25 S 17 '15 33d annual convention, Chicago, Sept. 7-10. Ry

Roads

R 57:324-6 S 11 '15
Roads

American road builders' association: abstracts of papers at the 11th annual convention held at Chicago, Dec. 14-18, 1914. Eng Rec 70: 603-5 D 19 '14

Benefits and burdens of better roads. S. E. Bradt. Good Roads n s 10:212-15 O 2 '15

Boulder parapet for roadways in Palisades interstate park, il Eng N 74:162-3 J1 22 '15

Comparative value of penetration roads. D. T. Pierce. il Good Roads n s 10:260-3 N 6 '15

Construction and maintenance of roads and bridges from July 1, 1913, to December 31, 1914. U S Agric Bul 284:1-64 '15

Convention of American road builders' association, Chicago, Dec. 14-18. Eng Rec 70:sup 305-6 D 26 '14

Design of cross-sections for steep grades on public highways. B. H. Piepmeier. il Eng & Contr 44:189-90 S 8 '15

Determination of the justifiable outlay for specific cases of highway improvement. C. Richardson, Good Roads n s 10:196-7 O 2 '15

Discussion of road construction at Am. Soc. of C. E. Eng N 73:186-7 Ja 28 '15

Economic factors all-important in rural highways. L. W. Page. Eng Rec 72:385 S 25 15

Economic factors involved in road construction in strictly rural sections. G. Henry. Eng & Contr 42:255-8 S 9 '14

Efficiency system for road contractors. J: H. Hammond. Eng & Contr 43:552-4 Je 23 '15

Equipment for highway work. A. Fehard. Good Roads n s 10:252-4 N 6 H. 6 '15 Blan-

Features of road construction: road surfacing and corrugation. Sci Am S 80:283 O 30 '15

5th American good roads congress and 11th annual convention of the American road builders' association at Chicago, Dec. 14-18, 1914. Good Roads n s 9:3-29, 53-75, 96-106 Ja 2, F 6, Mr 6 '15

Handling 400 tons of stone per day with auto trucks. Eng Rec 70:621-2 D 5 '14

Heavy traffic roads. H: G. Shirley. Eng Rec 70:534-5 N 14 '14; Same. Eng & Contr 42: 537-8 D 9 '14

How small communities may have good roads. L. W. Page. il Sci Am 112:14-15 Ja 2 '15

Improvement of a section of lightly travelled country road using funds limited in amount. S. P. Hooker. Eng & Contr 43:86-7 Ja 27 '15 Kinks in road construction, C. D. Franks. Eng Rec 71:197-8 F 13 '15

Roads -Continued

Location and construction of highways in mountain country, F. W. Harris, il diags Eng N 72:1199-1201 D 17 '14; Excerpt (Don'ts in mountain road location). Eng & Min J 99: 237-8 J a 30 '15

Maximum use of industrial railway possible at low cost. F. Tarrant. Eng Rec 71:653-4 My 22 '15

Motor truck in road building, il Munic Eng 48:205-8 Mr '15

Pan-American road congress proceedings at Oakland. Eng Rec 72:367-8, 397-8 S 18-25 '15

Plea for greater mileage. S. P. Hooker. Eng Rec 70:702 D 26 '14

Portable railway in highway construction, il Good Roads n s 9:180-1 My 1 '15

Road building with industrial equipment: twelve-car train hauled by a 20-horsepower dinkey, il Eng Rec 70:621 D 5 '14

Road congress at Atlanta. Good Roads n s 8: 217-20 D 5 '14

Road exhibition and conference, Horticultural hall, London. Engineer 120:27-8 J1 9 '15

Split road on curve forces autoists to keep to right, il Eng Rec 72:7 J1 3 '15

Theory of resistance to rolling of a hard body over a plastic surface; abstract. B. B. Schultz. Am Soc M E J 37:555-8 S '15

Traffic limits of various types of pavements. W. D. Washington. Eng & Contr 42:403-5 O 28 '14

Utilization of the motor truck in highway work, il Good Roads n s 9:171-9 My 1 '15

Utilization of the motor truck in highway work il Good Roads n s 9:171-9 My 1 '15 Wearing surfaces. G: W. Tillson. Good Roads n s 9:141-3 Ap 3 '15 Width, alignment grade and drainage features of the designing of country roads. R. A. Meeker. plan Eng & Contr 42:346-7 O 7 '14

Meeker, plan Eng & Contr 42:346-7 O 7 '14

See also Causeways; Curbs; Dust preventon; Earthwork; Guard rails (for highways);
Highway administration; Highway engineering; Pavements; Railroads; Railroads—Crossings; Road making machinery; Road maps;
Road materials; Road traffic; Sidewalks;
Speedways; Street cleaning; Street railroads; Streets; also Dixie highway; Lincoln highway

# Accounting

See Highway accounting

## Contracts

Going broke in road contracting. Eng & Contr 43:188 Mr 3 '15 Lump-sum contracts favored for Washington roads. Eng Rec 71:174 F 6 '15 Road contract of a hundred years ago. Eng & Contr 43:323-4 Ap 7 '15

# Convict labor

Colorado makes 50 per cent saving with convict labor. J. E. Maloney. Eng Rec 72:444 O 9 '15

Convict classification for state road work. G. P. Coleman. Eng Rec 71:751-2 Je 12 '15 Convict labor for highway work. G. P. Coleman. Good Roads n s 10:208-10 O 2 '15 Convict labor in road construction in Colorado; with discussion. T. J. Ehrhart. Good Roads n s 9:101-3 Mr 6 '15; Excerpt. Eng N 73:375

Convict labor on Alabama roads. Good Roads

n s 10:82 Ag 7 15 Convict labor on country roads, G: C. Warren, il Munic Eng 48:26-35 Ja 15

Convict work in Arizona. Munic J 39:430-2 S 16 '15 G. Twitchell.

Cumberland county, Maine, approves of convict labor on roads. Good Roads n s 10:69-70 Jl 24 '15

Organization and equipment of convict camps in Georgia; methods and cost. J: C. Koch. il diag Eng & Contr 43:433-5, 500-2 My 12, Je

Road building by convict labor, il Good Roads n s 8:211-16 D 5 '14

Road building with convict labor in Fulton county, Georgia. W. T. Wilson, il Eng & Contr 42:440-2 N 4 '14

Road construction in Reading township, Livingston county, with convict labor. B. H. Piepmeier. il Eng & Contr 44:39-41 Jl 14 '15

Utilization of short-term convicts for highway work in Georgia, J. L. Stanford, Munic Eng 48:124-6 F '15; Same, Eng & Contr 43: 290-1 Mr 31 '15 Washington's state highways and highway department, W: R. Roy, il Munic J 39:346-9 S

#### Cost

Comparative costs of brick and concrete roads in Illinois. H. E. Bilger. Eng N 73:633 Ap 1

Comparative costs of guard rail and wide fills on highways, diags Eng N 74:79-80 Jl 8 '15 Convict work in Arizona. F. G. Twitchell, Munic J 39:430-2 S 16 '15 Cost of highways in three states. Munic J 38: 425 An. 1 '15.

Convict work in Arizona. F. G. Twitchen. Munic J 33:430-2 S 16 '15
Cost of nighways in three states. Munic J 38: 425 Ap 1 '15
Cost of macadam object lesson roads in North Carolina. Eng & Contr 43:544-5 Je 16 '15
Costly road: Hudson county boulevard. Eng N 73:1049-50 My 27 '15
Costs of monolithic brick road construction. R. L. Bell. Eng & Contr 44:369 N 10 '15
Economical highway design. W. G. Harger. Eng N 73:1156-8 Je 17 '15
Expenditures for permanent and perishable features of roads. Eng Rec 70:635 D 12 '14
Highway bonds: a compilation of data and an analysis of economic features affecting construction and maintenance of highways financed by bond issues, and the theory of highway bond calculations. L. I. Hewes and J. W. Glover. U S Agric Bul 136:24-7 '15
Wethods and cost of road grading in West Virginia. A. D. Williams. Eng & Contr 43: 16-17 Ja 6 '15: Excerpt (Cost of grading and excavating). Concrete Cem 5:267-8 D '14
Methods and costs of constructing three sections of sand-clay road. J. H. Pratt. Eng & Contr 43:375-6 Ap 28 '15
Methods and costs of moving earth in southern road construction. N. C. Hughes, jr. Eng N. 73:734-5 Ap 15 '15
Methods and costs of road work in distric number two of Lowndes county, Mississippi il Good Roads n s 9:91-3 Mr 6 '15
Minnesota road work statistics for 1914. Eng & Contr 44:45 Jl 7 '15
Operation analysis of new machines whice cheapen the moving of earth on road work A. B. McDaniel. il Eng Rec 72:126-8 Jl 31 '1 Organization and standards of the Wisconsi highway commission, il diags Eng & Cont 42:398-403 O 28 '14

Organization and standards of the Wisconsi highway commission, il diags Eng & Cont 42:398-403 O 28 '14 Percentage of road money for roadbed, Horse less Age 34:897-8 D 23 '14 Price and cost of a road, H. E. Bilger, Munic Eng 48:286-8 My '15

Price in Illinois of three popular types of road Eng & Contr 43:345 Ap 14 '15

Progress of state management of public road J. E. Pennybacker. Eng & Contr 44:133 A 18 '15

Relative 20-year economy of various types roads and pavements. R. Trautschold. En roads and pavements. R. ... & Contr 44:89-91 Ag 4 '15

Resurfacing water bound macadam. S. C. Co son. Munic J 38:422-3 Ap 1 '15

Road maintenance: cost in France, Englar and Massachusetts. W: D. Sohier. Munic 37:956-7 D 31 '14

See also Haulage-Cost; Roads, Concrete Cost

# Cost of maintenance

See Roads-Maintenance and repair

# Crowns

Sloping versus curved crowns for highwa: W. S. Farley. Eng Rec 72:174 Ag 7 '15
Superclevation of curves on highways, Il nois practice. H. E. Bilger. Eng N 74:74
JI 8 '15

#### Drainage

Drains for county roads, 1915. Munic E 48:265 Ap '15

Road drainage and foundations, G: W. Cool Good Roads n s 10:202 O 2 '15

Subdrainage of earth roads, il Eng N 73:8 9 Ap 29 '15

Roads - Continued

# Finance

Finance

Apportionment of cost of highway bridges between street railways and cities; with discussion. C: M. Spofford, il diags W Soc E J 20:405-43 My '15

Benefits and burdens of better roads. S. E. Bradt. Good Roads n s 10:214-15 O 2 '15

County bond issues for road work during the present year. Good Roads n s 10:280 N 20 '15

Financing and building a county highway, il Munic Eng 48:328-32 Je '15

Financing county roadbuilding in Illinois, map Eng N 74:1019 D 2 '15

Financing of permanent road construction. W. A. McLean. Eng & Contr 43:231-2 Mr 10 '15

Gains made by state management of road con-

Gains made by state management of road construction and maintenance. J. E. Fennybacker. Eng Rec 72:189-90 Ag 14 '15 Good roads—bond issues—automobiles. A. A. Young. Eng M 49:600-1 Jl '15 Highway bonds: a compilation of data and an analysis of economic features affecting construction and maintenance of highways financed by bond issues, and the theory of highway bond calculations. L. I. Hewes and J. W. Glover. il maps U S Agric Bul 136:1-129 '15

Highway indebtedness; its limitation and regulation. N. P. Lewis. Good Roads n s 10: 194-6 O 2 '15

ife of highway improvement should limit term of bonds, N. P. Lewis, Eng Rec 72:352 S 18 '15 Life of

S 18 '15 Methods of retiring rural highway bonds. Horseless Age 34:558-9 D 9 '14 Motor truck and the road; who should pay the road tax? J: S. Harwhite. il Sci Am 113: 66+ J1 17 '15 Relation of farm produce hauling to permanent road improvements. W. A. McLean. Eng & Contr 42:215-17 Ag 26 '14 Road bonds should provide for maintenance. J. F. Witt. Eng Rec 72:352-3 S 18 '15 Road improvement. W. A. McLean. Good Roads n s 9:47-Ja 2 '15 State aid road work in New Jersey. il Good Roads n s 9:252-3 Je 19 '15

See also Roads-Cost

## Foundations

Costs of monolithic brick road construction. R. L. Bell. Eng & Contr 44:369 N 10 '15 Drainage and foundations on the Maine Post road. W: J. Dougherty. il Eng N 74:458 S 2

'15
Prevention of foundation movement in roads.
diags Eng & Contr 42:396 O 21 '14
Road drainage and foundations. G: W. Cooley.
Good Roads n s 10:202 O 2 '15
Road foundations—concrete, telford, gravel.
etc.; with discussion. J. A. Johnston. Good
Roads n s 9:14-21 Ja 2 '15

# Grades

Grades

Alignment and grades on country roads requiring a pavement not readily replaceable. Eng & Contr 43:21 Ja 13 '15

Conditions determining maximum grades and methods and cost of road grading in West Virginia. A. D. Williams. Eng & Contr 43: 16-17 Ja 6 '15

Design of cross-sections for steep grades on public highways. B. H. Piepmeier. il Eng & Contr 44:189-90 S 8 '15

Importance of grades increases with betterment of road. E. B. McCormick. Eng Rec 71:265-6 F 27 '15

Road grading in counties, 1915; tabulation. Munic Eng 48:258-60 Ap '15

# Inspection

Inspection of state aid road construction in Wisconsin. J. T. Donaghey. Eng & Contr 42:462 N 11 '14

See Highway law

#### Location

Lack of progress in methods of earth road location. W. C. Fawcett. Good Roads n s 9: 234 Je 5 '15

Preliminary surveys for Michigan highways cost \$2.72 per mile. Eng Rec 72:112 Jl 24 '15 Proper road location; its importance and effects. W: R. Roy. Good Roads n s 10:200-2 O

Road location and the economics of road improvement, D. T. Brown. Eng & Contr 43: 15-16 Ja 6 '15

oad reconnaissance and the application of sound engineering principles to road loca-tion in California. Eng & Contr 43:258 Mr 17

Surveys and construction plans for trunk line road construction in Michigan, il diags Eng & Contr 43:162-7 F 24 '15

# Maintenance and repair

How Minnesota maintains her earth roads. diag Eng Rec 71:745 Je 12 '15
Maintaining bituminous surfaces. W: H. Connell. Munic J 38:436-7 Ap 1 '15
Maintaining concrete and brick roads in Illinois. B. H. Piepmeier, il Eng N 74:310-13 Ag 12 '15

Maintenance. W. W. Crosby. Good Roads n s 9:188-9 My 1 '15

Maintenance and repair of Pennsylvania state roads. Eng & Contr 42:590-3 D 23 '14

Maintenance cost system used on U. S. experimental road. E. W. James and C. S. Reeve. il Eng Rec 71:418-21 Ap 3 '15

Maintenance: materials and methods. A. W. Dean. Good Roads n s 10:206-8 O 2 '15

Maintenance meglected in bond-built roads. Horseless Age 35:181 F 3 '15

Maintenance of macadam and gravel roads. Eng N 73:637-8 Ap 1 '15

Patrol system of road maintenance and repair in Pennsylvania. Eng & Contr 44:70-1 Jl 28

Patrol system of road maintenance and repair in Pennsylvania. Eng & Contr 44:70-1 Jl 28 '15; Same cond. Eng Rec 72:100 Jl 24 '15 Relative 20-year economy of various types of roads and pavements. R. Trautschold. Eng & Contr 44:89-91 Ag 4 '15 Repair and maintenance costs of park roads in Boston, Mass., in 1913. Eng & Contr 42:234 S 2 '14

S 2 14 Road-maintenance costkeeping in Pennsylvania. Eng N 74:250-3 Ag 5 '15 Road maintenance costs in Monroe county; New York state highways. Eng & Contr 43: 511-12 Je 9 '15

511-12 Je 9 '15
Road maintenance in San Joaquin county,
California. W. B. Hogan. il map Eng &
Contr 42:122-9 Ag 5 '14
Traffic and the methods and cost of road
maintenance in Massachusetts and a comparison with English and French conditions.
W. D. Sohier. Eng & Contr 42:607-12 D 30
'14; Same cond. Eng N 72:1036-8 N 19 '14;
Same cond. Munic J 37:956-7 D 31 '14
Tropical road maintenance complicated by
floods. Eng Rec 72:224 Ag 21 '15

See also Roads—Surface treatment

See also Roads-Surface treatment

# Specifications

New and different specification for concrete roads, W. W. Crosby, Eng & Contr 44:384-5 N 17 '15

N 17 '15
Organization and standards of the Pennsylvania state highway department, il diags Eng & Contr 42:186-93 Ag 19 '14
Organization for and methods and cost of state aid road construction in Alabama, il diags Eng & Contr 42:506-8 N 25 '14
Report of the American road builders' association committee on standards, Good Roads n s 9:223-9 Je 5 '15
Road specifications with special reference to rolling, W. W. Crosby, Eng & Contr 42:594-6

oad or rolling. V

rolling. W. W. Crosty.
D 23 '14

Specifications and standards of the Maine highway commission. diags Eng & Contr 42; 276-81 S 16 '14

Specifications covering the rolling of road crusts of various types. W. W. Crosby. Good Roads n s 10:172-3 S 18 '15

Surveys and construction plans for trunk line road construction in Michigan, il diags Eng & Contr 43:164-6 F 24 '15

Uniform plans and specifications. A. D. Williams. Good Roads n s 10:263 N 6 '15

State aid

See Roads-Finance; Roads, State aid

Roads - ( untinued

Surface treatment

Surface treatment

Comparative value of penetration roads. D. T. Pierce. il Good Roads n s 10:260-3 N 6 '15

Construction of bituminous surfaces on country roads. Munic Eng 49:71-2 Ag '15

Cost of bituminous surfacing for roads analyzed. il Eng Rec 72:336 S 11 '15

Maintaining bituminous surfaces. W: H. Connell. Munic J 38:436-7 Ap 1 '15

Methods and cost of constructing a bituminous carpet on concrete roads. F. W. Whitlow. Eng & Contr 42:569-70 D 16 '14

Progress reports of experiments in dust prevention and road preservation, 1914. U S

Agric Bul 257:1-44 '15

Resurfacing an old concrete road. il Munic J 37:265-6 D 31 '14

Resurfacing old roads. W: D. Uhler. Good Roads n s 10:210-12 O 2 '15; Same cond. Eng

Roads it is 10/210-12 O 2 15; Same cond. Eng. Res. 72/301-2 S 25 15.

Road and boulevard construction in Philadelphia, with tables of costs. Il map Munic Eng. 48:243-8 Ap '15.

Specifications for the application of resurfacing asphalt binder. Eng. N. 73:770 Ap 22 '15.

Surfacing the Boston Post road. Il Munic J. 39:547-8 O 7 '15.

Litter of himmings carried treatment and

39:547-8 O 7 '15
Unit costs of bituminous carpet treatment and bituminous macadam by the penetration method on two roads in Illinois. Eng & Contr 42:524 D 2 '14
Unit costs of resurfacing portions of the Niagara river road in Queen Victoria Park, Canada. J: H. Jackson. il Eng & Contr 42:536 D 9 '14

See also Roads, Oiled; Roads, Tarred

Terminology

Bituminous nomenclature, Eng & Contr 42:491-

2 N 25 '14 Bituminous road construction; committee report to Am. Soc. C. E. Munic J 38:286-8 Mr 4 '15; Same. Eng & Contr 43:278-80 Mr 24

Proposed standard definitions of road and pavement materials. Munic Eng 49:76 Ag '15 Proposed standard terms for bituminous road materials. Eng & Contr 42:234-5 S 2 '14 What is asphaltic concrete? Munic J 38:697-8 My 20 '15

Width

oad and pavement dimensions—widths, depths and crown; with discussion. L. White. Good Roads n s 9:8-14 Ja 2 '15 Road

Alabama

Highway improvement in the far South. C: E. Foote. il Horseless Age 35:481-2 Ap 7 '15 Organization for and methods and cost of state aid read construction in Alabama. il diags Eng & Contr 42:504-8 N 25 '14

Alaska

Alaska's road and bridge builders face snow, frozen ground and glacial floods. G. E. Edgerton. il map Eng Rec 71:764-6 Je 19 '15; Abstract. Eng M 49:736-7 Ag '15 Methods and cost of road and trail construction in Alaska. F. A. Pope, map Eng & Contr 42:231-4, 302-4 S 2, 23 '14

California

California

Building a 3000-mile highway system for \$18,000,000. Eng Rec 71:233-4 F 20 '15

California highway commission's work. A. B. Fletcher. il Munic J 39:352-4 S 2 '15

California state highways. A. B. Fletcher. il Good Roads n s 10:119-26 S 4 '15

Concrete base construction on California state highways. J. B. Woodson, Eng & Contr 42:235 S 2 '14

Example of costly Lathern construction. il Eng Rec 72:102 Jl 24 '15

New California road overcomes mountain barrier. N. D. Darlington, il Eng Rec 72:322-3 S 11 '15

Colorado

New automobile highway ascends Pikes Peak, il map Eng Rec 71:769-70 Je 19 '15 Phases of road improvement work in Colorado, J. E. Maloney, Good Roads n s 10:97-8 Ag 7 '15

oad construction in Denver's mountain parks. O. B. Thum. il plan Munic J 38:417-20 Ap 1 15 Road

Florida

Florida

Highway conditions in Florida. C: E. Foote. Good Roads n s 9:139-40 Ap 3 '15

Impressions of Florida roads. ii Good Roads n s 9:144-5 Ap 3 '15

Misuse of a good paving material is detrimental to Florida road development. C: E. Foote. il Eng Rec 71:452-3 Ap 10 '15

Road improvement in the far South. C: E. Foote. il Horseless Age 35:351-2 Mr 10 '15

Sand-asphalt may solve Florida road problem. C: E. Foote. il Eng Rec 71:622-3 My 15 '15

Sheet asphalt for Florida roads. G: L. Watsold, il Munit. J. Foote. 18 '20 Constitution of the control of the con

Georgia

Road building with convict labor in Fulton county, Georgia. W. T. Wilson. il Eng & Contr 42:440-2 N 4 '14

Great Britain

Life of English roads as determined from traffic statistics. W. de H. Washington, Eng & Contr 42:594 D 23 '14

Hawaii

Features of highway work in Hawaii, il Good Roads n s 9:182-4 My 1 '15

Idaho

Proposed Idaho state highways il Eng N 73: 936 My 13 '15 Survey of the Idaho state highway system. il Good Roads n s 9:219-21 Je 5 '15

Illinois

Concrete and brick as paving materials on Illinois highways. H. E. Bilger, Eng & Contr 43:254-5 Mr 17 '15 Organization of road work under the Illinois highway commission, il map Eng & Contr 43:468-72 My 26 '15

43:403-72 My 20 15 Revised cross-sections for Illinois roads. H. E. Bilger, il Eng N 74:584-7 S 23 '15 Selecting rural-road types for the state of Illinois. W: W. Marr. Eng N 74:834 O 28 '15

India

British India. U S Sp Cons Rep 72:182-6 '15

lowa

Experiment with gravel roads in Iowa, T. R. Agg, il Eng Rec 72:664-6 N 27 '15

Massachusetts

Bituminous penetration roads in Massachusetts equal those built by the mixing method, il Eng Rec 71:608-10 My 15 '15 Traffic and the methods and cost of road maintenance in Massachusetts and a comparison with English and French conditions, W. D. Sohier, Eng & Contr 42:607-12 D 30 '14; Same cond, Eng N 72:1036-8 N 19 '11; Same cond, Munic J 37:206-7 D 31 '14

Michigan

Surveys and construction plans for trunk line road construction in Michigan, il diags Eng & Contr 43:162-7 F 24 '15

Minnesota

Minnesota road work statistics for 1914. Eng & Contr 44:4-5 Jl 7 '15

Mississippl

Methods and cost of gravel road construction in a road improvement district in Lowndes county. il Eng & Contr 42:301-2 S 23 '14 Methods and cost of road work in district number two of Lowndes county, Mississippi. il Good Roads n s 9:91-3 Mr 6 '15

New Jersey

Costly road. Eng N 73:1049-50 My 27 '15
Making a road up the Palisades, il plan Eng
N 74:998-1000 N 18 '15
Roadway up the Palisades, il Munic J 37:94953 D 31 '14

New Mexico

Road construction in solid rock side hill, New Mexico. diag Eng & Contr 43:504 Je 2 '15

loads ' ifi...

#### New York

Affine reading Miles in the Hosting was a little in Nove Y of State highways. A. H. Blanchard. Sch Mines Q 36:147-53 Ja '15

Engine ting the starth was New York ingle-way work. Eng N 73:787-8 Ap 22 15 New York highway work. Munic J 38:423-5 Ap New 1

1 15 Storm King highway, New York, H. E. Breed, il map Eng N 74:721-4 O 14 15 Storm King road a shelf blasted in mountain-ter for the first transfer of the first first it. 71:12-1 F 16 15

# Ohio

Brick roads and streets, J: Laylin, Munic Eng 48:10-15 Ja '15: Same, with discussion, Good Roads n s 9:56-50 F 6 '15 Highway construction in Ohio; details of work contemplated in 37 counties. Eng & Contr 43:sup<sup>22</sup>-3 Ap 14 '15

# Oregon

Columbia highway in Oregon. H: L. Bowlby. il Eng N 73:62-4 Ja 14 15
Dry masonry walls for highway embankments. il Eng Rec 70:687 D 26 14
Oregon's state highways. H. M. White. il Mont. S. Road improvement in Multnomah county. Ore-

# Pennsylvania

Equipment and methods used on a state aid road contract in Pennsylvania, il Good Reads

Pennsylvania builds concrete road as object lesson, il Eng Rec 72:530-1 O 30 15

# Philippine Islands

Philippine road built at high level to escape flood damage. il map Eng Rec 72:264-6 Ag 28 '15

Road system of Batangas province, Philippine Islands, il Good Roads n s 9:106-7 Mr 6 '15

# Texas

Highway system of Tarrant county, Texas. il Good Roads n s 9:136-7 Ap 3 '15

Macadam road construction in Texas. J. F. Witt II line & hill Late 8 14

## United States

County roads to be constructed, 1915; tabulation. Munic Eng 48:257-61 Ap '15
Data concerning highway construction. Munic J 38:432-3 Ap 1 '15
Mileage of good roads in the United States. Munic J 38:435-6 Ap 1 '15

Notes from state highway departments. Munic J 38:429-31 Ap 1 15

\$108.191.774 for roads in 1914. J. E: Schipper. map Automobile 33:139-42 Jl 22 '15

Review of road work done in the several states in 1914 and that proposed for the cur-rent year. Good Roads n s 10:5-16 Jl 3 '15

Review of road work in the United States during the present year and forecast of work in 1917. In the control of the control o

Roadway surfaces of state aid roads. F. F. Rogers. Eng & Contr 44:281-3 O 13 '15;

# Virginia

Methods and cost of constructing a mountain W: F. Cocke, il map Eng & Contr 43:341-4

Sand- La is lay road construction in Virginia. L. Healp, il Englassi att 42:768-4 I/ 20

# Washington

Brick Mishways in Kins county, Westingn n. F. W. Allen, it dings Munit J 27:77 - 2 10 3 14

Washington's state highways and highway de-partment. W: R. Roy. il Munic J 39:343-9 S 2 '15

## Wisconsin

Organization and standards of the Wisconsin highway commission, il diags Eng & Contr

Roads, Bituminous Bitulitnic pavement and Warrenite roadway. G. H. Perkins, il Boston Soc C E J 1:119-31 Mr 14

Mr 14
Bituminous macadam reads in Rhode Island.
I. W. Patterson. Munic Eng 47:437-41 D '14;
Abstract. Eng Rec 71:77-8 Ja 16 '15
Bituminous penetration reads in Massachusetts equal those built by the mixing method. il Eng Rec 71:608-10 My 15 '15
Bituminous read construction; committee report to Am. Soc. C. E. Munic J 38:285-8 Mr 4 '15; Excerpt (Definitions of terms). Eng & Contr 43:275-80 Mr 24 '15
Kentucky rock asphalt read. G. D. Crain, jr. Munic J 39:3865-6 S 2 '15
Sand-asphalt may solve Florida read problem. C: E. Foote, il Eng Rec 71:622-3 My 15 '15
Sheet asphalt for Florida reads. G: L. Wat-

15 15 Sheet asphalt for Florida reads, G: L. Watson, il Munic J 39:503-6 S 30 15 Types of bituminous construction, F. P. Smith, Mun.

La shadats, Illuminious

Roads, Brick Brick and concrete country roads, Munic J 39: \_364-2 S 2 '15

k highways in King county, Washington, W. Allen, il diags Munic J 37:795-9 D 3

Brick monoliting construction of county high-O 6 15: Same cond. (Illinois finds new mortar bed an improvement) Eng Rec 72:453-4

O 9 15
Brick pavement on old gravel road foundation for portion of the Lincoln highway. F. A. Churchill. Eng & Contr 43:546 Je 16 15
Brick road built menolithic at Paris, Ill. W. T. Blackburn. il Eng Rec 72:54-5 Jl 10 15
Brick road construction in Florida. W. P. Biair. Eng Rec 71:691-2 My 29 15
Brick road construction upon a sand base in Hillsborough county, Florida. il Eng & Contr 44:333-6 O 27 15
Brick road on machine-leveled subgrade. Eng

H1333-6 O 27 15
Brick road on machine-leveled subgrade. Eng Rec 71:209 F 13 15
Brick reads and streets. J: Laylin. Munic Eng 48:10-15 Ja 15; Same, with discussion. Good Roads n s 9:56-60 F 6 15
Concrete and brick as paving materials on Illinois highways. H. E. Bilger. Eng & Contr 43:254-5 Mr 17 15
Features of brick road construction in Illinois. R. L. Bell, il Eng & Contr 43:159-60 F 17

Misuse of a good paving material is detrimental to Florida road development. C: E. Foote, il Eng Rec 71:452-3 Ap 10 '15 New type of brick road construction, il Munic Eng 49:57-8 Ag '15 Ohio uses cement-sand support for brick pavement. D. Moomaw. Eng Rec 72:455 O 9

Program of permanency on the Pacific high-way. A. P. Denton, il Munic Eng 49:30-2 Jl

'15
Proposed construction to reduce the cost of brick roads. J. S. Tucker, Eng & Contr 43: 374-5 Ap 28 '15; Discussion. H. E. Bilger; J. I. Tucker, 48:466-7 My 5 '15
Reducing the cost of brick roads in Illinois. H. E. Bilger, Eng N 73:696-7 Ap 8 '15
Revised cross-sections for Illinois roads. H. E. Bilger, Il Eng N 74:584-7 S 23 '15
Rigid bed eliminates noise and subsurface pockets. F. A. Churchill. Eng Rec 72:455-6 O 9 '15

See also Pavements, Brick

Roads, Concrete
Aggregate mechanically handled from pit to road, il Eng Rec 72:133-4 Jl 31 '15
Brick and concrete country roads, Munic J 39: 361-2 S 2 '15
California concrete road; construction methods:

California concrete road: construction methods. J. B. Woodson. Munic J 38:421-2 Ap 1

Roads, Concrete -Continued

California highway commission's work. A. B. Fletcher. il Munic J 39:352-4 S 2 '15 California state highways. A. B. Fletcher. il Good Roads n s 10:119-26 S 4 '15 Combination concrete road and flood channel. Los Angeles county, Calif. R. Bennett. il diags Eng N 73:42-3 Ja 7 '15 Concrete and brick as paving materials on Illinois highways. H. E. Bilger. Eng & Contr 43:254-5 Mr 17 '15 Concrete base construction of Children and Children and Children and Children and Concrete base construction of Children and C

Concrete base construction on California state highways, J. B. Woodson. Eng & Contr 42: 235 S 2 '14

235 S 2 '14

Concrete material tables have saved money on road work. Eng Rec 72:207 Ag 14 '15

Concrete materials tested in a Jones-Talbot rattler. Eng Rec 71:390 Mr 27 '15

Concrete road at Winnetka, Ill. S. E. Bates. il Munic J 39:429-30 S 16 '15

Concrete road building in cold weather requires precautions. Eng Rec 72:641-2 N 20 '15

Concrete-road building with small concrete mixers, il Eng N 72:1168 D 10 '14 Concrete road with a single crack in 44, miles the result of careful construction on Connecticut turnpike. il Eng Rec 71:480-2 Ap

Connecticut turnpike, il Eng Rec 71:480-2 Ap 17 '15 Concrete roads and frost action. A. M. Lovis. Eng & Contr 43:367 Ap 21 '15 Concrete roads and frost action. S. T. Morse. Eng & Contr 43:436 My 12 '15 Concrete roads; with discussion. H. J. Kuelling. Good Roads n s 9:68-70 F 6 '15; Same cond. Eng Rec 70:665 D 19 '14; Same cond. Concrete Cem 6:96 F '15; Abstract. Munic J 38:433-4 Ap 1 '15 Construction and maintenance details of concrete road work in Wayne county, Michigan, in 1914 il Eng & Contr 42:457-60 N 11 '14 Construction methods and costs and service records for concrete roads in Ohio. Eng & Contr 42:160-3 Ag 12 '14 Construction of concrete roads in Milwaukee county, Wisconsin, in 1914. H. J. Kuelling. il map Concrete Cem 6:70-4 F '15 Difficult construction of concrete road; the Cedar Point automobile road, il Munic Eng 48:310-12 My '15 Economical handling of a large concrete road contract. il Concrete Cem 7:97-8 S '15 Estimating the cost of concrete roads in Milwaukee county, Wisconsin, and methods and cost of maintenance. H. J. Kuelling. Eng & Contr 43:207-8 Mr 3 '15 Excavating aggregates with drag line and hauling by motor truck on Indiana concrete road work. S. E. Bates. il plans Eng & Contr 44:231-3 S 22 '15 Financing and building a county highway. il Munic Eng 48:328-32 Je '15

44:231-3 S 22 '15 Financing and building a county highway, il Munic Eng 48:328-32 Je '15 Gasoline locomotive hauls material trains for concrete highway, il Eng Rec 71:152 Ja 30

How do you man your paving mixer? diags Eng Rec 72:240 Ag 21 '15 Hydrated lime in road concrete. Eng N 73:503 Mr 11 '15

Improvement of Sheridan road in Highland Park, III. S. E. Bates, il Munic Eng 48:359-60 Je '15

vestigation of the concrete road-making properties of Minnesota stone and gravel. C: F. Shoop. il Minn U Bul 2:1-55'15 Investigation

Investigation to determine the relative resistance to wear of concrete made of different aggregates, C. F. Shoop, il Eng & Contr 44: 144-7 Ag 25 '15

144-7 Ag 25 15
Kinks in concrete road and pavement construction. C. D. Franks. il diags Eng & Contr 43:114-18 F 10 '15: Excerpt (Supply and use of water in concrete road building). Munic Eng 48:121-4 F '15
Materials for concrete road delivered in industrial cars from central plant. il Eng Rec 71:295-6 Mr 6 '15

Method of carrying concrete road over trenches with soft backfill. Concrete Cem 7: trenches

trenches with soft backing concrete cent 7. 69 Ag '15 lethod of constructing concrete read in freezing weather, H. C. Campbell, il Eng & Contr 44:348 N 3 '15

Methods and cost of concrete road construction by day labor under the supervision of the Illinois highway commission. Eng & Contr 43:118-20 F 10 '15
Methods and cost of constructing a bituminous carpet on concrete roads. F. W. Whitlow. Eng & Contr 42:569-70 D 16 '14
Methods and cost of constructing a concrete road in LaSalle co., Illinois. B. H. Piepmeier il Eng & Contr 43:109-10 F 3 '15
Methods and cost of constructing a rolled concrete road in Washington. H: L. Bowlby. il Eng & Contr 43:203-6 Mr 3 '15
Methods and cost of constructing nine miles of concrete state road in California. J. B. Woodson. Eng & Contr 43:107-9 F 3 '15
Methods, organization and equipment for concrete road construction. C. H. Moorefield and J. T. Voshell. diags Eng & Contr 44: 168-70 S 1 '15
New and different specification for concrete roads. W. W. Crosby. Eng & Contr 44:384-5 N 17 '15

roads. W N 17 '15

N 17 '15
Notes on concrete road construction. Eng N 73:77 Ja 14 '15
Novel concrete road plan for curve on grade. il Munic Eng 49:69 Ag '15
Old National road and its reconstruction. C. H. Moorefield. Il Eng & Contr 43:227-9 Mr 10 '15
Papers, reports and discussions on concrete roads presented at 11th annual convention of American concrete institute. Concrete Cem 6:113-15 Mr '15
Pennsylvania builds concrete road as object lesson. il Eng Rec 72:530-1 O 30 '15
Recent improvements in the methods of handling materials in concrete road construction.

ling materials in concrete road construction. Eng & Contr 43:113-14 F 10 '15
Reinforcing and sub-grade drainage to eliminate cracking in concrete roads. J: W. Mueller; A. M. Lovis. Concrete Cem 7:111-13

Mueller; A. M. Lovis. Concrete Cem 7:111-13 Resurfacing an old concrete road, il Munic J 37:955-6 D 31 '14 Revised cross-sections for Illinois roads. H. E. Bilger, il Eng N 74:584-7 S 23 '15 Road engineer experiments with hydrated lime. Eng Rec 71:798-9 Je 26 '15 Rolling wet concrete for roads, il Eng N 73: 829 Ap 29 '15 Steel side and curb forms, il Munic Eng 49: 83 Ag '15 Study of a water supply by pumping for concrete road construction, plan Eng & Contr 43:467-8 My 26 '15 Testing aggregates for concrete roads built by the New York highway commission. H. S. Mattimore. Eng & Contr 43:294-6 Mr 31 '15; Same cond. Munic Eng 48:131-3 F '15: Except (Sand for concrete pavements). Munic J 38:420-1 Ap 1 '15 Use of hydrated lime in concrete roads. L. N. Whiteraft, Good Roads n s 10:160-1 S 4 '15 Wayne co. (Mich.) roads. F. F. Rogers. Concrete class Pavements, Concrete

See also Pavements, Concrete

# Cost

Daily cost-data sheets on concrete road construction. Eng Rec 71:676 My 29 '15
Detailed cost of a recently completed concrete road near Aurora, Illinois. Eng & Contr 42: 301 S 23 '14

201 S 23 '11
Estimating the cost of concrete roads in Milwaukee county, Wisconsin, and methods and cost of maintenance; abstracts. H. J. Kuelling. Eng & Contr 43:207-8 Mr 3 '15; Concrete Cem 6:114-15 Mr '15
Hauling gravel with motor truck and trailers; a service test in concrete road construction. il Eng & Contr 42:535-6 D 9 '14
Method of estimating the cost of a concrete road. H. J. Kuelling. Eng & Contr 43:446-7 My 19 '15
Methods and cost of constructing a concrete

My 19 '15
Methods and cost of constructing a concrete road in LaSalle co., Illinois. B. H. Piepmeier. il Eng & Contr 43:109-10 F 2 '15
Methods and cost of constructing nine miles of concrete state road in California. J. B. Woodson. Eng & Contr 43:107-9 F 3 '15
1915 practice of prominent builders of concrete roads. Concrete Cem 7:39-11 Jl '15
Washed aggregate and machine-finished surface, features of Michigan concrete road. i

Roads, Earth

Earth and gravel road construction and maintenance, I. O. Baker, Good Roads n s 9:70-3

R 6 13 Rebuilding rural roads in the southern states, G. B. Buchanan, il Eng N 74:446-8 8 2 15 Subdrainage of earth roads, il Eng N 73:828-9 Ap 29 15

Unsatisfactory experience with sand-clay roads, S: H. Lea. Eng N 73:873 My 6 '15

Roads, Experimental

Maintenance cost system used on U. S. experimental road. E. W. James and C. S. Reeve. il Eng Rec 71:418-21 Ap 3 '15

Philadelphia's test road. il Munic J 38:772-4 Je

8 115 Road and boulevard construction in Phila-delphia, il map Munic Eng 48:243-5 Ap '15

Roads, Gravel

loads, Gravel
Building gravel roads in Logan county, Illinois. J: I. Miller. Eng N 72:1265-6 D 24 '14
Construction of gravel roads in Iowa. T. R. Agg. Eng & Contr 42:217-18 Ag 26 '14
Demonstration of gravel road construction using motor truck and road grader. R. L. Morrison. il Eng & Contr 42:205 S 15 '15
Experiment with gravel roads in Iowa. T. R. Agg. il Eng Rec 72:664-6 N 27 '15
Methods and cost of gravel road construction in a road improvement district in Lowndes county, Mississippi. il Eng & Contr 42:301-2 S 23 '14
Methods and cost of road work in district

S 23 14 Methods and cost of road work in district number two of Lowndes county, Mississippi, il Good Roads n s 9:91-3 Mr 6 '15 Methods of constructing and maintaining gravel roads in Ohio. A. H. Hinkle. Eng & Contr 43:376-7 Ap 28 '15

Roads, Macadamized

Cost of macadam object lesson roads in North Carolina. Eng & Contr 43:544-5 Je 16 '15 Method of reconstruction of old macadam roads. D. T. Brown. Eng & Contr 44:202-3 S

Methods and costs of building a macadam road using an industrial railway. R. P. Ma-son, il Eng & Contr 43:322-3 Ap 7 '15 Resurfacing old macadam roads with War-renite, il map Good Roads n s 8:222-6 D 5 '14

Resurfacing water bound macadam. S. C. Corson. Munic J 38:422-3 Ap 1 '15
Strengthening the macadam road to meet modern traffic, Munic Eng 48:318+ My '15
Traffic limits of various types of pavements. W. D. Washington. Eng & Contr 42:403-4
O 28 '14

Roads, Mountain, See Mountain roads

Roads, Oiled

Joacs, Olled Diagram for computing quantity of road oil required. Eng & Contr 44:71 Jl 28 '15

How oiled earth roads are built in Kansas. W. S. Gearhart. il Eng Rec 72:193 Ag 14 '15

Iowa experiments with oil on dirt roads. il Eng Rec 72:15-16 Jl 3 '15

Method of applying oil for dust prevention. Eng & Contr 43:435-6 My 12 '15

Sec also Engal oilers, Poed oiler, Street

See also Road oilers; Road oils; Street oiling

Roads, State
Gains made by state management of road construction and maintenance. J. E. Pennybacker. Eng Rec 72:189-90 Ag 14 '15

See also Roads, subheads California, Idaho, and names of other states

Roads, State aid

Miles of state aid roads; table. Eng & Contr 44:282 O 13 '15; Same. Good Roads n s 10: 203 O 2 '15

Organization for and methods and cost of state aid road construction in Alabama. il diags Eng & Contr 42:506-8 N 25 '14

Roads, Tarred

toads, Tarred

Design and construction of bituminous surfaced roads in England. W. H. Maxwell.

Eng & Contr 42:258-60 S 9 '14

Effect of tarred roads upon trees. Sci Am 112:

344 Ap 10 '15

Methods of applying tars for dust prevention.

Eng & Contr 43:445-6 My 19 '15

Resurfacing water bound macadam. S. C. Corson Munic J 38:429-3 Ap 1 '15.

son. Munic J 38:422-3 Ap 1 '15

Simply constructed tar-macadam road, il Eng N 74:81-2 Jl 8 '15

Roasters. See Furnaces, Metallurgical

Robbia, Luca della, 1399-1482 Luca della Robbia, by A. Marquand. Review. Arch Rec 37:378-80 Ap '15

Robins, Thomas, 1868-Sketch, por Eng M 50:219 N '15

Rochester, New York

Rapid transit

Decision in Rochester fare case. Elec Ry J 45: \_ 439-40 F 27 '15

439-40 F 27 '15 Rochester train operation; operation of motor and trailer combinations has relieved traffic congestion in downtown section. diags Elec Ry J 45:752-3 Ap 17 '15 Telephone dispatching in city service. E. E. Strong. il Elec Ry J 45:885-7 My 8 '15

Air and electric rock drills. Elec R & W Elec'n 67:480 S 11 '15

Air and electric rock drills. Elec R & W Elec'n 67:480 S 11 '15
Churn-drilling costs, Sacramento hill, Arizona.

A. Notman. il map Am Inst Min E Bul 104:
1677-90 Ag '15
Comparative methods and costs of preparing rock for steam shovels. C: C. Phelps. il Eng & Contr 43:321 Ap 7 '15
Fort Wayne electric rock drill. C. Jackson. il Gen Elec R 18:273-7 Ap '15
Handling drill steel at the Quincy mine. L. H. Goodwin. plan Eng & Min J 99:16 Ja 2 '15
How the repair man sees it. H. E. Scott. Eng & Min J 100:800-1 N 13 '15
How to choose rock drills. J. R. McFarland. Eng & Min J 100:719-23 O 30 '15
Jack-hammer successfully run with steam on sewer trench job. C: J. Phelps. il Eng Rec 71:278 F 27 '15
Method of rock drilling for dredge excavation

Method of rock drilling for dredge excavation in land drainage. C. N. Olson, diag Eng & Contr 44:151 Ag 25 '15

Modern rotary drill. H. R. Hughes. il diags Am Inst Min E Bul 99:629-35 Mr '15; Same cond. Eng N 73:928-9 My 13 '15; Abstract. Ind Eng 15:59-60 F '15; Abstract. Colliery 35:522 My '15; Discussion. Am Inst Min E Bul 101:1162 My '15

New bit for rotary drilling, il Eng & Contr 43:525 Je 9 '15

Pneumatic drill-column. S. V. Bergh. diag Eng & Min J 99:14 Ja 2 '15 Quarrying with air hammer drills on scaffolds. C: C. Phelps. diags Eng & Min J 99:903 My 22 '15

Record of Temple-Ingersoll drills on the Mesabi range. Eng & Min J 98:1042-3 D 12 '14

Rock-drill nicknames. J. R. McFarland. Eng & Min J 99:860-1 My 15 '15
Rock drills in mining. L. O. Kellogg. il diags 'Eng M 49:535-52 Jl '15

Subaqueous rock excavation. C: C. Pheli diags Eng N 74:1020-1, 1062-7 N 25-D 2 Phelps.

Testing and application of harmor drills.

B: F. Tillson, diags Am Inst Min E Bul 98:
505-28 F '15; Excerpt (How the drill bit breaks the rock). Eng & Min J 99:573-4 Mr
27 '15; Discussion. Am Inst Min E Bul 101: 1197-1201 My '15

Union portable gasoline churn drill. il Eng & Min J 99:491-2 Mr 13 '15

Western Electric hammer drill. diag Eng & Min J 100:638 O 16 '15

See also Drilling and boring (earth and

rocks); Mining machinery

## Fallures

Failure and heat treatment of drill steel. S. V. Bergh. il diags Eng & Min J 99:612-14 Ap 3

Failure of hollow drill-steel, T. E. Sturtevant, Eng & Min J 99:579 Mr 27'15

## Manufacture

Motor drive in a rock-drill factory. F. D. Burr. il Elec W 65:1700-1 Je 26 '15

# Sharpening

See Sharpening

Rock drills -- Continued

Testina

Tests of rock drills at North Star mine, California. R. H. Bedford and W: Hague. il Am Inst Min E Bul 92:1807-16 Ag '14; Same cond. Eng & Min J 98:255-7 Ag 8 '14; Same cond. Eng Rec 70:374 O 3 '14; Same cond. Eng & Contr 42:463-5 N 11 '14; Excerpt. Eng & Min J 98:439 S 5 '14; Discussion. Am Inst Min E Bul 95:2750-1 N '14

Rock dust

Methods of preventing and limiting explosions in coal mines. G: S. Rice and L. M. Jones. diags pls U S Bur Mines Tech Pa 84:1-42

Pulmonary disease among miners in the Joplin district, Missouri, and its relation to rock dust in the mines. A. J. Lanza and E. Higgins. il U S Bur Mines Tech Pa 105:22-47 '15; Abstract. Eng & Min J 99:331-3 F 13 '15 Respirators vs. water sprays. Eng & Min J 100:856-7 N 20 '15 Rock-aust sampler. O. Ruhl. il Eng & Min J 99:238 Ja 30 '15

Rock Island & Pacific railroad. See Chicago, Rock Island & Pacific railroad

Rock-sounding rig. il diags Eng N 73:683-4 Ap 8

Rocket camera. See Photography, Military

Rockhouses

Shaft-rockhouse practice in the copper country. L. H. Goodwin. il diags Eng & Min J 99:1061-6, 1107-10; 100:7-12, 53-7 Je 19-Jl 10

Sulphide-bearing rocks from Litchfield, Conn. E. Howe, diags Econ Geol 10:330-47 Je '15

See also Geology; Granite; Graywacke; Limestone; Mineralogy; Shale

Rocks, Igneous

ocks, igneous
Alunite and pyrophyllite in triassic volcanics
at Kyuquot Sound, British Columbia. C: H.
Clapp. Econ Geol 10:70-88 Ja '15
Oil in an igneous rock. J. A. Udden. Econ Geol
10:582-5 S '15

Rocky mountain national park
Women's work in conservation. Mrs. J: D.
Sherman. Am For 21:641-2 My '15

Rocky mountains

ocky mountains Origin of the Rocky mountains. S. J. Scho-field. il Sci Am S 79:88-9 F 6 '15 Parks in the Canadian Cordillera. J: A. Allan. il Sci Am S 80:360-2 D 4 '15

Continuous casting machine. R: C. Patterson. diag Metal Ind n s 13:254-5 Je '15
Continuous rod casting machine. il Sci Am 113: 165+ Ag 21 '15
Continuous rod-casting process; construction and operation of a casting machine designed to simplify the manufacture of rods and wire. E: K. Hammond, il diag Mach 21: 765-7 My '15
Mellen rod-casting machine. R. C. Patterson.

765-7 My '15
Mellen rod-casting machine. R. C. Patterson, jr. il Am Inst Min E Bul 101:919-25 My '15; Same. Iron Age 95:996-8 My 6 '15; Same. Iron Tr R 57:446-7+ S 2 '15; Abstract. Am Soc M E J 37:346-7 Je '15; Abstract. Eng M 49: 593-4 Jl '15
Tôrsional strengths of guy anchor rods. T. Croft. diags Elec W 65:1607-9 Je 19 '15

Roentgen rays. See X rays Roentgenology. See X rays

Roller bearings

American lineshaft hanger bearing, il Mach 21: 1024 Ag '15

Application of roller bearings to mine-car haulage. P. N. Case. diags. Eng & Min J 100:144-6 Jl 24 '15
Double-head automatic for finishing roller bearing rollers. il diag Mach 21:965 Ag '15
Making roller bearings. il Iron Age 96:127 Jl 15 '15

Press tools for making a roller bearing cage. il diags Mach 21:547-9 Mr 15

Roller-bearing trolley wheels, il Elec Ry J 45:996-7 My 22 '15

Roller journal bearing, diags Ry Age (Mech ed) 89:141-2 Mr '15

Roller skating

Regulation

Regulation of roller skating on streets and sidewalks, A. L. Bostwick, Munic J 38:658 My 13 '15

Rolling

Theory of resistance to rolling of a hard body over a plastic surface; abstract. B. B. Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S

Rolling mills

Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S '15 '15 'Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S '75 'Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S '75 'Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S '76 'Schultz. Am Soc M E J 37:478-9, 555-8 Ag-S '80 'In Many Special Steel company's new bar mill. Is diags Iron Age 95:1002-4 My 6 '15 'Cold rolling mills made in America. It Iron Tr R 56:520+ Mr 11 '15 Development of the merchant rolling mill. J. R. George, il diags Iron Tr R 56:1125-8+ Je 3 '15; Same. Iron Age 95:1282-6 Je 10 '15 Device for changing rolling-mill rolls. diag Iron Age 95:133 Ja 14 '15; Iron Tr R 56: 178 Ja 21 '15 Device for changing rolling-mill rolls. diag Iron Age 95:133 Ja 14 '15; Iron Tr R 56: 178 Ja 21 '15 Displaced volume and power in rolling mills; identity of results obtained from two commonly used equations. F. Denk. Iron Age 96:283-90 Ag 5 '15 Efficiency of blooming mills. C: L. Kuderer. Iron Tr R 57:489 S 9 '15 Electric driven mill at Warren, Ohio. diags Iron Tr R 56:868-70 Ap 29 '15 Electrical practice in steel mills. D. M. Petty. Iron Tr R 57:941-2 N 11 '15 Features of central station power. E. Chesrown. Iron Tr R 57:583-4 S 23 '15 Great Northern reclamation plant. il Ry Age (Mech ed) 89:305-8 Je '15; Same. Ry Age '58:967-70 My 7 '15 Heavy electric reversing mills. W. Sykes. il Iron Tr R 55:1181-3+ D 24 '14 How special shapes are rolled. E. C. Kreutzberg. il Iron Tr R 56:123-6 Ja 14 '15 Hydraulic rolling mill operating valve. diag Iron Age 96:811 O 7 '15 Installing rolling-mill anchor bolts. A. Connley. diags Iron Age 96:296-7 Ag 5 '15 Large steel-mill motor drive, il Elec W 66: 1089-90 N 13 '15 Low-pressure turbine at the Carpenter steel mill. il plan Power 42:74-5 Jl 20 '15 Mill for cold rolling steel; plant of the Schwartz-Herrmann steel works for rolling band steel. il Iron Age 96:892-3 Ap 22 '15 Modern plant for rolling iron: St. Louis screw co. H. C. Estep. il diags plans Iron Tr R 57:32-9+ Jl 8 '15 New rolling mill near Salt Lake City to utilize iron and steel scrap. il plan Iron Age 96

pid reconstruction of old mill; remodeled plant of Mansfield sheet & tin plate co. R. V. Sawhill. il Iron Tr R 56:817-19 Ap 22 Rapid

715
Rolling mill with steam turbine drive: plant of the Carpenter steel company. il plan Iron Age 94:1221-4 N 26 '14; Same. Iron Tr R 55:997-1000 N 26 '14; Same. Power 41:455-6 Mr 20 '15; Same cond. Eng M 48:591-3 In '15 Rolling mill work. Iron Age 95:102 Ja 7 '15 My 20 '15

Rolling strip steel in New Jersey; new plant of Schwartz-Herrmann steel works, C. J. Stark, il Iron Tr R 56:779-80 Ap 15 '15

Steam turbine mill drive; with discussion.

J. D. Berg, il diags Eng Soc W Pa 30:778-803 N '14; Abstract. Am Soc M E J 37:233-9

Ap '15

Steel mill castings: use of manganese steel in heavy rolling mill equipment, G: Tripp. il Iron Tr R 56:49-53 Ja 7 '15

Steel mill controllers from the operator's standpoint, J. S. Riggs, Am Inst E E Pro 34:715-22 My '15; Discussion, 34:2869-94 N '15 Temperatures in rolling steel rails. Iron Age 96:19-22 Jl 1 '15

Rolling mills -Continued

olling mills—Continued
Test of large reversing engine and rolling mill.
K. Nibecker, il diags Eng Soc W Pa 30:533-65 Jl '14; Abstract, Am Soc M E J 37:55-6 Ja '15; Discussion, Eng Soc W Pa 30:565-640, 804-8 Jl, N '14
Unusual roughing mill; a German three-high two-pass unit. B. Quast, il diag Iron Age 96: 931 O 21 '15
Unitable speed, drives for volling mills, M. A.

Variable-speed drives for rolling mills. K. A. Pauly. Power 42:527-8 O 12 '15; Abstract (Two control systems for steel-mill motor drives). diag Elec W 66:865-6 O 16 '15

See also Rolls (machinery); Steel works

#### Records

Electrical repair record system; methods of National tube co. J: F. Kelly. Iron Tr R 56:1064-7 My 27 '15; Same cond. Iron Age 95:1070 My 13 '15; Discussion. Iron Tr R 56: 1067-9 My 27 '15
Keep record of electrical repairs. G. E. Stoltz. Iron Tr R 56:967-9+ My 13 '15; Same cond. (Steel mill electric motors). Iron Age 95: 952-3 Ap 29 '15

Rolls (machinery)
Mixture for chilled crusher rolls, W. J. Keep,
Foundry 43:187 My '15
Roll design for several sections, C. Holzweiler.

Iron Age 94:1467-9 D 24 '14
Successful roll operation. J. Humes. Eng & Min J 99:615-16 Ap 3 '15

Roman architecture. See Architecture, Roman Rome, Ancient

# Industry

Roman technics and industry in early Germany, Sci Am S 79:130 F 27 '15

Rome (city)

American academy in Rome. C. G. La Farge. il Am Inst Arch J 3:52-72 F '15

#### Architecture

Villa Madama: text and measured drawings by Howard W. Germann, il Arch Rec 36:500-10, 37:26-47 D '14-Ja '15

Roof flanges

Developing pattern for roof flange and hood, diags Metal Work 84:283 Ag 27 '15 Developing roof flange and plate pattern, diags Metal Work 84:335 S 10 '15

Roofing

Accounting system for roofing business. E. B. Bourlier. Metal Work 83:39-42 Ja 1 '15 Corrugated asbestos cement sheets for roofing and siding. diags Eng & Contr 44:214 S 15 '15; Iron Age 96:407 Ag 19 '15; Ry Age 59: 537 S 17 '15; Ind Eng 15:103-4 S '15; Am Gas Light J 103:220-1 O 4 '15 Rooning materials in Kongo. Metal Work 83: 258 Mr 5 '15

Rooning materials in Kongo, Metal Work 83: 358 Mr 5 '15
Sheet metal product selling campaigns. R. Danzer. Metal Work 83:42+ Ja 1 '15
Shingle roofs and fire limits. W. B. Conant. Munic J 38:189-90 F 11 '15
Terne plate and sheet metal for roofing. J:
Troland; C: D. Puckett. Metal Work 83: 902-4 Je 18 '15
Use of slate as a roofing material. J. C. Taylor, Bldg Age 37:46 Mr '15

Roofs

cofs
Constructing galvanized iron silo roof, diags
Metal Work 83:534-6 Ap 9 '15
Detailed information on roof framing. Bldg
Age 37:55-6 My '15
Details of an unusual truss roof, J: Y. Dunlop, d'ags Bldg Age 37:62 JI '15
Eccentric heel joint of roof truss: solution of
problem, E: H. Rockwell, Eng N 74:796-8 O
21 '15

Framing a Mansard roof with dormers. O. B. Maginnis, diags Bldg Age 37:64-5 Ja '15 Graphic method of detailing hip-rafter con-ections. C. L. C. Magee. Eng Rec 71:562-3

My 1 '15 ow a large truss roof was raised, J. F. Hobart, il Bldg Age 37:26-30 My '15

Laying galvanized corrugated roofing sheets. E. Stern. diags Metal Work 83:844-5 Je 11

Laying slates in putty. il Bldg Age 37:34 S

Metal flashings for slate or shingle roofs. diags Metal Work 84:299 S 3 '15 Metal roof coverings in Galveston hurricane. C: D. Puckett. il Metal Work 84:336 S 10

Method of laying standing seam roofing. Metal Work 83:497+ Ap 2 '15 Moments at eccentric heel-joint of roof truss. C: W. Chassaing. Eng N 73:990 My 20 '15 Reinforcement for the roof timbers of Westminster hall, England. F. Baines. Eng & Contr 42:172-5 Ag 19 '14 Roof framing chart. J. J. Umbs. Bldg Age 37: 54-6 H 175

Roof framing chart. J. J. Umbs. Bldg Age 37: 54-6 Jl '15
Roof framing with the steel square. il Bldg Age 37:45-6 N '15
Roof framing with the steel square. D. P. Barry. Bldg Age 37:45-6 O '15
Roof replacement in Superior, Wis. diag Elec W 65:792-3 Mr '27 '15
Safe construction of church roof trusses. K. D. Schwendener. Bldg Age 37:52-3 Mr '15
Three roofs furnish more dirt than 4½ miles of street. il Eng Rec 71:683 My 29 '15

See also Building; Car roofs; Ceilings; omes; Girders; Gutters (roof); Roofing; caffolding; Steel construction; Strains and Domes; Girders; Scaffolding; Steel stresses; Trusses

Roofs, Concrete

cofs, Concrete
Concrete roof for a root cellar, McCullough, diags plan Bldg Age 37:54-6 Jl '15
Experiences with concrete in the republic of Panama, A. P. Crary, il diags Eng N 73: 214-16 F 4 '15
Long-span roof slab of concrete and tile; concrete top surface, large hollow tile, and two-way reinforcement, M. Miller, il Eng Rec 71:516-17 Ap 24 '15
Methods and costs of providing slopes for drainage on flat concrete roofs, A. M. Wolf, diags Concrete Cem 6:86-8 F '15

ope
Care and use of hoisting accessories; wire
rope, manila rope, hooks, chains, accessories,
lubrication of wire rope, strength of slings.
Mach 21:297-8 D '14
Electricity in twine and rope mills. il Elec R
& W Elec'n 67:551-4 S 25 '15
Experiments to determine stresses in parts
of rope falls, C. S. Adams. Eng Rec 72:4256 O 2 '15
Lateral friction of winding ropes; abstract.
H. W. G. Halbaum. Am Soc M E J 37:351-2
Je '15
Use and care of manila rope. F E. Weise, Eng.

Use and care of manila rope, F, E. Weise, Eng & Contr 44:345-6 N 3 '15

See also Knots and splices; Manila rope; Rope driving

# Testing

New rope-testing machine, il diag Eng N 74: 172-3 Jl 22 '15

Rope driving

Transmitting power by rope drives. H: D. Jackson, il diag Power 40:808-11 D 8 '14 See also Belting

Ropeways. See Cableways

Rotary converters
Converter station of Aluminum company of
America, Maryville, Tenn. il Power 41:776-7 Je 8 '15

Feeder-tap resistance in rotary-converter practice, L. P. Crecelius; E. C. Baugher, Elec Ry J 45:799-800 Ap 24 '15

45,000-kw. synchronous converter substation of the Aluminum company of America at Massena Springs, N. Y. J. L. Burnham and R. C. Muir. il diag Gen Elec R 18:873-8 S '15

Motor-generators versus rotary converters. E. Friedlaender. Power 42:458 S 28 '15

Parallel operation of frequency changers. G. Rettew. diag Gen Elec R 18:836-8 Ag '15

Polarity reversal in synchronous converters, E. R. Shepard, diags Elec W 65:210-11 Ja 23

Practical notes on rotary converters. Elec R. & W Elec'n 66:989 My 29 '15

Protecting synchronous converters, plan Pow-er 42:171-2 Ag 3 '15

Rotary converters--Continued

Recent improvements in single-phase rotary converters. V. A. Fynn. il Elec W 66:1045-6 N 6 '15

converters. V. A. Fynn, il Elec W 66:1045-6 N 6 '15 Same starting equipment for large and small machines, il plan Elec W 65:420-1 F 13 '15 Sixty-cycle rotary converters. Engineer 118: 538-9 D 4 '14 Sixty-cycle rotary converters in series in 1500-volt service, diags Elec Ry J 45:633-4 Mr 27 '15 Synchropus booster—converter, for Dayton

Synchronous booster—converter for Dayton
power and light company, if Elec R & W
Elec'n 66:1213 Je 26 15
Unusual experience with rotary converter.
F. W. Swift, diag Power 41:97 Ja 19 '15
Rotation of the earth. See Earth—Rotation

converter.

Roundhouses

Best practices in engine house work. D; E. Barton. Ry Age (Mech ed) 89:139 Mr '15
Big Bill Agnew and blue Monday. H. D. Wolcomb. Ry Age (Mech ed) 89:533-6 O '15
Efficiency in a modern engine house. J: C. Murdock. Ry Age (Mech ed) 88:642-3 D '14
Engine failures, their causes and cure. J. E. Anderson. Ry Age (Mech ed) 89:587-8 N '15
Engine house organization. W. P. Huntley. Ry Age (Mech ed) 89:135-6 Mr '15
Engine houses; principles of design; committee report of A. R. E. A. Eng & Contr 43: 300 Mr 31 '15
Features of engine house design, B. Bird.

300 Mr 31 '15
Features of engine house design. B. Bird.
diags Ry R 57:142-3 Jl 31 '15
Handling work reports at engine houses. J. E.
Tefft. Ry Age (Mech ed) 89:31-2 Ja '15
Modern concrete and brick roundhouse at Du
Bois, Pa. il diag Ry Age 58:1110-11 My 28

Reinforced concrete and brick roundhouse of the Buffalo, Rochester & Pittsburgh Ry., at Dubois, Pa. diags plans Eng & Contr 44: 66-9 Jl 28 '15

66-9 Jl 28 '15
Reinforced-concrete roundhouse at Dubois. il diags Eng Rec 71:167-9 F 6 '15
Roundhouse efficiency. Ry Age (Mech ed) 89: 423-5 Ag '15; Same cond. Ry Age 59:156-7 Jl 23 '15; Abstract. Ry R 57:119 Jl 24 '15
Smoke exhauster for the St. Paul engine house at Chicago. W. S. Lacher. il diags Ry Age 58:98-9 Ja 15 '15
Suggestions for a properly kept roundhouse. W. U. Appleton. Ry Age (Mech ed) 89:187-8 Ap '15
Training engine house foremen. P. C. Cilbais

Training engine house foremen. R. G. Gilbride. Ry Age (Mech ed) 89:81 F '15

Routing systems

Eisemann's train-dispatcher system. J. E: Schipper. il plans Automobile 32:580-5 Ap

Schipper. 11 plans Automobile 32:580-5 Ap 1 '15
New Taylor-Wharton plant with diagram of layout, il Iron Tr R 57:794-7+ O 21 '15
Routing—schedule and despatch. G: D. Babcock, il Ind Eng 14:427-31 N '14
Shop system of the American machine & foundry co. E: K. Hammond, diags Mach 21: 446-50 F '15

Rubber

Details of rubber embargo lifting. Horseless Age 35:222-3 F 17 '15
Electricity in rub or mills, il Elec R & W
Elec'n 66:573-9 Mr 27 '15
Electricity in the rubber industry. E. W. Pilgrim. Am Inst E E Pro 34:3028-33 D '15
Factors involved in motor application, with particular reference to the rubber industry.
A. P. Lewis. Am Inst E E Pro 34:2666-74
N '15

Hysteresis tests for rubber, E. L. Davies, J Ind & Eng Chem descript 114 Instruments to test rubber, il Automobile 33: 65 Jl 8 '15

Measuring the hardness and elasticity of rubber. il Sci Am 113:236 S 11 '15
Measuring the hardness of rubber. il Iron Age 95:1393 Je 24 '15

Pontianak (Jellutong) rubber resin. C. Ellis and A. A. Wells. J Ind & Eng Chem 7:747-50 S '15

Recent methods for the determination of total sulphur in rubber. J. B. Tuttle and A. Isaacs. U. S. Bur Stand Tech. Pa. 45:1-16 '15; Same. J. Ind & Eng Chem 7:658-63 Ag '15

Reclaimed rubber. Engineer 120:428-9 N 5 '15

Specification of vulcanized rubber gum by vol-ume and its determination by a new solu-tion method. F. Gottsch. il J Ind & Eng Chem 7:582-6 JI '15 Testing of rubber goods, il diags U S Bur Stand Circ 38:1-89 '15

Vulcanization experiments on plantation para rubber, the cause of variability; abstract, B. J. Eaton and J. Grantham. Am Soc M E J 37:725-6 D '15

Rubber, Artificial
Artificial production of caoutchouc, F. W.
Hinrichsen, Sci Am S 79:339-400 Je 19 '15
Potatoes and salt, R. Chauvenet, Met & Chem
Eng 12:741-2 D '14
Present status of synthetic production, F. W.
Hinrichsen, Horseless Age 36:145+ Ag 1 '15

Rubber, Substitutes for Rubber substitute; coal tar chief ingredient of Rubber substitute; 22:1143 Je 24 '15

Rubidium

Potential of the rubidium electrode. G. N. Lewis and W: L. Argo. diag Am Chem Soc J 37:1983-90 S '15

Runes

low we got our alphabet; earlier English and Irish alphabets. W. Rice. Inland Ptr 55; 83-4 Ap '15 How

Rural architecture, See Bungalows; Country houses; Farm buildings

Rural electric service. See Electric service, Rural Rural schools

Rural school and the hookworm disease, il Sci Am S 79:164-5 Mr 13 '15

Ruskin, John, 1819-1900 Architectural draughtsmen. H: Winslow. il Am Inst Arch J 3:406-20 O '15

Russia

See also Railroads-Russia

Army

Bath trains of the Russian army, il Sci Am 113:13 Jl 3 '15; Same. Metal Work 84:363-4 S 17 '15

Commerce

American opportunity for Russian business, D: L. Hough, map Iron Age 95:616-17 Mr 18

Engineering openings in Russia. Sci Am 112: Ap 3 '15

Russia and her trade. Engineer 119:173-4 F

Russia and its trade possibilities. A. Znamiecki. Am Ind 15:19-22, 28-9 Ja-F '15
Russia from the point of view of an American engineer and business man, D: L. Hough. Iron Age 95:664-8 Mr 25 '15

Industries and resources

Electrical development in Russia. L. W. Schmidt. Elec W 65:1719-20 Je 26 '15 Refrigeration and cognate enterprises in Russia. M. T. Zarotchenzeff. Am Ind 16:17-19+ sia.

N 15 Russia—its future as a coal and iron producer, C: R. King. map Eng M 48:481-92 Ja '15 Russia's power resources; extensive water falls and peat deposits await exploitation, maps Eng M 49:909-12 S '15

See also Mines and mineral resources-Russia

Public works

Two large irrigation projects in Russia. M. Nikolitch. il map Eng N 74:8-11, 102-4 Jl 1, 15 '15; Abstract. Eng M 50:457-9 D '15

Rust. See Corrosion and anti-corrosives

Ryerson, Joseph T., & son Retailing steel mill products, il plan Iron Tr R 56:65-71 Ja 7 15

New burglar-proof safe. Sci Am 112:593 Je 12 Safes

See also Vaults

Safety at sea

Application of subdivision rules adopted at
International conference; abstract. J. Donaid. Int Marine Eng 20:9 Ja '15

Emergency exit from boiler rooms. il Sci
Am 113:201+ S 4 '15

Emergency marine gangway. il Sci Am 112:
410 My 1 '15

Einergency mergency escape. diags Int Marine

Fire-room emergency escape. diags Int Marine Eng 20:410-12 S '15

Eng 20:410-12 S '15 International conference on safety of life at sea: abstract. E. T. Chamberlain, Int Marine Eng 20:8-9 Ja '15 Providing a ship with ears; a system for lo-cating other ships and icebergs during fog. R. G. Skerrett. il Sci Am 113:450 N 20 '15

See also Collisions at sea; Davits; Fires at sea; Fog signals; Life preservers; Lifeboats; Lighthouses

Safety committees

Organizing for safety; safety inspectors and safety committees. A. J. Daly. Mach 21:281-2 D '14

Organizing safety committees. H. A. Russell. il Iron Age 96:69-70 Jl 8 '15
Results of accident-prevention work in Commonwealth Edison organization. Elec W 65: 1187 My 8 '15

Safety council, National. See National safety council

Safety devices and measures
Accident prevention. C: B. Scott. Am Gas
Light J 103:139-40 Ag 30 '15
Accident prevention in power plants. Power
42:281-2 Ag 24 '15
Accident prevention in the chemical industries. F: W. Keough. Met & Chem Eng 13:
731-4 O 15 '15; Excerpts. Am Ind 16:23-4 N

Eye protection for grinders and machinists.
H. W. Davie. il Mach 21:570-1 Mr '15
Gas safety code of the Bureau of standards.
R. S. McBride. Am Gas Light J 103:44-5 Jl
19 '15

Hazards of factory floors. il Am Ind 15:sup1-4

My '15

How safety-first devices were displayed in Pittsburgh department store windows. il Iron Age 95:496-9 Mr 4 '15

Industrial betterment. F. E. Cardullo. il Mach 22:185-90 N '15

22:185-90 N '15
Industrial safety, C: B. Scott, Am Gas Light J 103:181-2 S 20 '15
Industrial safety and principles of management, W. P. Barba, Am Soc M E J 37:692-5 D '15; Same cond, Iron Age 96:1232-4 N 25

Making the safety movement permanent. Elec Ry J 45:717, 800-1 Ap 10, 24 '15 Organizing for safety; safety inspectors and safety committees. A. J. Daly. Mach 21:281-2 D '14 weeks applications. E. Occurred. 11

Preventing cupola explosions. F. Odiag Iron Tr R 55:1228+ D 31 '14

Report of committee on accident prevention. Am Gas Inst Pro 9:pt 1, 82-110; Discussion. 9: pt 1, 111-20 '14

Safe hand tools, il Iron Tr R 56:523-4 Mr 11
'15; Same. Eng & Min J 99:531-2 Mr 20 '15;
Same. Ind Eng 15:19-20 Ja '15

Safeguarding of ladders, stairs and platforms. il diags Am Ind 15:sup1-4 F '15

Safety and welfare work in an electrical plant. C. L. Lucas. il Mach 22:210-14 N '15

Safety first for you and me. H. L. Brownell, Elec Ry J 45:749 Ap 17 '15

Safety first in road building. Eng Rec 72:270 Ag 28 '15

Safety in care and use of industrial railways. diag Foundry 43:105-6 Mr '15; Same. Ind Eng 15:73-5 Ag '15; Same cond. Eng M 48:603-5 Ja.

Ja '15
Safety in handling refrigerants. A. G. Solomon. Power 41:170-1 F 2 '15
Safety in sheet metal operations. il Am Ind 15:sup1-4 Ap '15
Safety in stone quarrying. O. Bowles. il U S Bur Mines Tech Pa 111:1-46 '15
Safety in the home and on the streets. il Am Ind 15:24-5 My '15
Safety on the streets. J. P. McCall. Am Ind 15:24-5 F '15
Safety reminders. Am Gas Light I 102:410 Je 28

Safety reminders. Am Gas Light J 102:410 Je 28

Safety second—service first; abstract. W. H. Blood. Elec W 65:422 F 13 '15 2d annual Pennsylvania industrial welfare and efficiency conference. Metal Work 82:733 D

4 '14
Sixth award of the Scientific American medal for safety devices. W: H. Tolman. il Sci Am 112:174 F 20 '15
Standardization in safety and sanitation. M. W. Alexander. Am Ind 15:26-7 F '15
Standardization of safeguards. C. M. Hansen. Am Ind 16:20-2 N '15
Wisconsin safety rules. Iron Age 96:89 Jl 8

Workmen's co-operation reduces accidents, il Iron Age 95:1051-4 My 13 '15

Iron Age 95:1051-4 My 13 '15

See also Air brakes; Boilers—Safety devices; Brakes; Car couplings; Coal mines and mining—Safety measures; Cranes, derricks, etc.—Safety devices; Electric engineering—Safety devices; Electric protective apparatus; Electric railroads—Safety devices; Factories—Lighting; Foundries—Safety devices; Goggles; Grinding machines—Safety devices; Helmets; Lighting conductors; Machine shops—Safety devices; Machinery—Safety devices; Mine rescue work: Mining engineering—Safety measures; Motor trucks—Fenders; Railroads—Safety devices; Railroads—Signals; Safety at sea; Safety devices; Street railroads—Safety devices; Subways—Safety devices; Subways—Safety devices; Subways—Safety devices; Street railroads—Safety devices; Street feeration of America

Safety first federation of America 1st meeting, New York, July 13. Elec Ry J 46:103-5 Jl 17 '15

Safety lamps
Benzine substitutes for safety lamps. Colliery
35:656 Jl '15
Miners' carbide lamps. J. W. Paul. U S Bur
Mines Circ 18:1-10 '15
Miner's lamps. Illum Engr 7:551-2 D '14
Oil vs. electric safety lamps. H. H. Hirsch.
Colliery 35:335-7 Ja '15

Colliery 35:335-7 Ja '15

Safety lamps, Electric
Electric lights for use about oil and gas wells,
H. H. Clark. U S Bur Mines Tech Pa 79:1-7
'14; Excerpts (Electric lamps in gaseous
places). Ry R 56:387 Mr 13 '15
Miners' electric safety lamps. Engineer 118:
548 D 11 '14
New type of miner's electric lamp. il Elec R
& W Elec'n 66:398-9 F 27 '15: Elec W 65:
563-4 F 27 '15; Colliery 35:507-8 Ap '15; Iron
Tr R 56:723 Ap 8 '15
One year's experience with the electric safety lamp. C. Johnson. Colliery 35:548 My '15
Pearson's electric miners' lamp works. il Engineer 120:138-9 Ag 6 '15
Self-contained portable electric lamps for
miners. H. H. Clark. Illum Eng Soc 9:395908 no 9 '14

Safety valves

908 no 9 '14

Safety valves
As dangerous as dynamite: a steam boiler
with an inoperative safety valve. Power 41:
137 Ja 26 '15

Calculation of dimensions of safety valves
with high lift; abstract. Otte. Am Soc M E
J 37:481 Ag '15

Clips for securing date tags to steam gages
and safety valves. C. L. Dickert. diags Ry
Age (Mech ed) 89:131-2 Mr '15

Locomotive safety valve, diag Ry Age (Mech ed) 89:255 My '15

fassachusetts ammonia safety regulations. F. L. Fairbanks. diags Power 42:753-6 N 30 Massachusetts

Safety valves -- Continued

metry valves—tonlinuca
Method of testing safety valves at the U. S.
naval experiment station; abstract. L. R.
Ford. Am Soc M E J 37:611-12 O '15
Overloading of safety valves, Power 41:282 F

23 15
Safety-valve specifications. A. B. Carhart.
Power 41:81-2 Ja 19 '15
Safety-valve specifications. G: E. Perkins.
Power 41:241-2 F 16 '15
Safety valves—a discussion. A. B. Carhart.
Power 41:509-11 Ap 13 '15
Safety valves for oil fired boilers; abstract. D.
MacNicoll. diags Am Soc M E J 37:660-1 N

Visits of inspector Brown, J. E. Terman, diag Power 42:508-9 O 12 '15

Safety zones. See Street traffic

Sailing vessels
One hundred percent efficient, yet obsolete.
Int Marine Eng 20:36 Ja '15

St. Eloi, Abbey of Ancient abbey of St. Eloi. J. Alaux. il Am Inst Arch J 3:12-13 Ja '15

St. Louis, Missouri Progress of city planning in St. Louis. plans Am Inst Arch J 3:271 Je '15

# Architecture

Washington university. G. Study. il plan Arch Rec 37:64-75 Ja '15

#### Bridges

Building a long concrete viaduct at St. Louis. P. A. Richardson, il Eng Rec 70:692-3 D 26

Completing the new Mississippi river bridge at St. Louis. Eng N 73:954-5 My 13 '15 Reinforced-concrete viaduct at St. Louis, Mo. C. W. Martin, il diags Eng N 74:725-7 O 14 '15

St. Louis municipal bridge east approach a steel viaduct nearly 3 miles long. diags Eng Rec 72:634-5 N 20 '15

Three-mile approach viaduct, St. Louis municipal bridge, diag Eng N 74:454-5 S 2 '15

## Charter

New charter for St. Louis, E: Flad, Am Soc M E J 37:88 F '15

# Park department

Development of a unit cost system. N. Cunliff. il Assn Eng Soc J 53:74-85 Ag '14; Same. Eng & Contr 42:374-6 O 21 '14; Discussion. Assn Eng Soc J 53:85-101, 165-70 Ag-S '14

# Public works

Municipal dock for St. Louis. Eng N 74:1101 D

### Railroads

Eliminating the Tower Grove grade crossing at St. Louis. il diags plan Eng N 74:52-5 Jl

Elmination of the Tower Grove crossings, St. Louis, Mo. S. L. Wonson, il diags plans Assn Eng Soc J 55:95-115 O '15; Same cond. Ry Age 59:799-802 O 29 '15; Same cond. Eng Rec 72:627-9 N 20 '15

St. Louis, inadequate terminal facilities. Ry Age 59:147-8 Jl 23 '15

### Rapid transit

Regulation of jitney busses in St. Louis. Munic Eng 48:341-2 Je '15

St. Louis service order; Missouri commission fixes service standards, defining rush-hour periods, transition periods and non-rush-hour periods. Elec Ry J 45:961 My 15 '15

# Sanitary affairs

Garbage and refuse collection and disposal. Munic Eng 48:340-1 Je '15

# Sewerage

New sewer inlets at St. Louis. S. Chivvis. il diags Eng N 74:652-3 S 30 '15

#### Streets

Engineering work preliminary to pavement construction, plans Eng N 74:460-1 S 2 '15

Water supply

Water supply

New intake tower and tunnel. E; C. Davis. il
diags plans Assn Eng Soc J 53:281-300 D '14

Opening of St. Louis filtration plant. il Eng N
73:1002 My 20 '15

St. Louis water works improvements. Munic
J 39:360-1 S 2 '15

St. Louis will operate world's largest mechanical filters next week; views. Eng Rec 71:
578-9 My 8 '15

St. Louis & San Francisco railroad
Abstract of annual report, map Ry Age 59:
884-6 N 12 '15
Comparison between the 1914 and 1913 fiscal
years, map Ry Age 58:119-21 Ja 22 '15 . Louis Southwestern railway Twenty-fourth annual report, map Ry Age 59:792-3, 836-8 O 29 '15

#### St. Paul, Minnesota Churches

House of Hope Presbyterian church, il plan Arch Rec 37:410-24 My '15

#### Railroads

New railway passenger terminal at St. Paul. plans Eng N 73:485-9 Mr 11, '15 Plans for the new Union station, diags Ry Age 58:261-3 F 12 '15

Sakurajima, Mt. Sakurajima eruptions and earthquakes. E. Omori. Sci Am S 79:242-3 Ap 17 '15

Salaries

Way to pay the salesman: salary-plus-com-mission plan. Elec W 65:1698-1700 Je 26 '15; Same. Am Gas Light J 103:71+ Ag 2 '15

Salem, Massachusetts Rebuilding Salem, Mass. W. B. Conant. il Munic J 39:218-19 Ag 12 '15

#### Fire, 1914

Salem (Mass.) conflagration; with discussion. C: H. Smith. il W Soc E J 20:172-92 F '15

Sales

Acceptance binds parties to contract. E. J. Buckley. Metal Work 84:655 N 19 '15 Balancing production with sales. C. W. Thay-

Balancing production with sales. C. W. Thayer. Mach 21:968 Ag '15
Difficulties attending the sale of a business. E. J. Buckley. Metal Work 83:552 Ap 9 '15
Exclusive agencies and the Clayton act. Elec R & W Elec'n 66:527-9 Mr 20 '15
Inspecting goods after they are received; the buyer's rights and liabilities. E. J. Buckley. Elec R & W Elec'n 67:416 S 4 '15; Same (Right of buyer to reject goods shipped). Metal Work 84:355 S 10 '15
Installment sales. S. Walton. J Account 20: 143-8 Ag '15
Legality of exclusive agencies upheld. Elec R & W Elec'n 66:908 My 15 '15
Protecting dealer on producer's guarantee. E. J. Buckley. Metal Work 84:593 N 5 '15
Recording returned goods. H. A. Russell. Iron Age 96:585 S 9 '15
Sales helps for the dealer. il Horseless Age 35:531-2 Ap 21 '15
ales departments

Sales departments

ales departments
Central-station sales department organization
and work. F. D. Beardslee. Elec R & W
Elec'n 65:1073-9 D 5 '14
Commercial practices in California. H. B.
Pitts. il Elec W 65:1409-12 My 29 '15
Way to pay the salesman: salary-plus-commission plan. Elec W 65:1698-1700 Je 26 '15;
Same. Am Gas Light J 103:71+ Ag 2 '15

Sales letters

Building business by circular letter. W: J. Wooley. Metal Work 84:42-3 Jl 9 '15 Building plumbing trade by mail. H. Whitehead, Dom Eng 71:6-8 Ap 3 '15 Business methods for the plumber and fitter. W. A. Fink. Dom Eng 70:369; 71:34-5 Mr 20, Ap 10 '15

Salesmen and salesmanship

As Perlmutter would say, "Silence is nix."
F, Farrington, Metal Work 84:486-7 O 15 '15
Avoiding be.ng at salesments or solicitors'
mercy, E, J. Buckley, Elec R & W Elec'n
67:485-6 S 11 '15
Boy as a factor in selling, Horseless Age 35:
427 Mr 31 '15

Salesman and salesmanship—Continued
Business hints for dealer and contractor, G. D.
Crain, jr. Elec R & W Elec'n 67:324-5 Ag
21 '15

Business relations of salesman and employer.

Crain, jr. Elec R & W Elec'n 67:324-5 Ag 21 '15
Business relations of salesman and employer, F. Farrington. Metal Work 84:578-9 N 5 '15
Card recoros in selling accessories. Horseless Age 35:229-30 F 17 '15
Details of Cincinnati appliance campaign. Elec R & W Elec'n 67:360-1 Ag 28 '15
Engineers' salesmanship. A. H. Pohlman. Power 41:723-4 My 25 '15
Enthusiasm and the prospective customer. F. Farrington. Metal Work 84:4-5 J1 2 '15
Enthusiasm keynote of good salesmanship. R. T. Gebler. Metal Work 84:519-20 O 22 '15
Evening courses in retail selling at University of Minnesota. Am Ind 15:18 Ja '15
Going after the business. H. Whitehead. Dom Eng 70:271-2 F 27 '15
Hints for salesmen. J: G: Jones. Am Gas Light J 103:75-6 Ag 2 '15
How a purchasing agent views the electrical salesmen who come to sell him goods. G: R. Jones. Elec W 66:1151-2 N 20 '15
How to select, train and hold your selling force. Am Gas Light J 102:166-7 Mr 15 '15
How to use the sales engineer. A. A. Dowd. Iron Tr R 56:667-72 Ap 1 '15
How to use the sales engineer. A. A. Dowd. il diags Iron Tr R 56:459-63+, 667-72, 927-39-Mr 4, Ap 1, My 6 '15
Hundred-pointer and the counter-jumper. F. Farrington. Metal Work 81:611-2 N 12 '15
Intelligent study always brings reward. F. Farrington. Metal Work 81:611-2 N 12 '15
Motion picture in industry utilized by manufacturers of machinery in selling their products. A. L. Morris. il Iron Tr R 56:517-18
Mr 11 '15
N. E. L. A. committee report on education of salesmen. Elec W 65:1522-3 Je 12 '15; Elec R & W Elec'n 66:1109 Je 12 '15
Organization meetings. Horseless Age 35:195-6 F 10' 15
Paving commissions on cancelled orders. E. J.

Paying commissions on cancelled orders. E. J. Buckley. Elec R & W Elec'n 67:234 Ag 7 '15 Price cutting as viewed by the traveling salesman. J. K. Simpkins, Metal Work 83:433 Mr 19 '15

19 '15
Printer and his business. L; H. Grieve. Inland Ptr 55:63-4 Ap '15
Producers give assistance to distributors. Metal Work 83:37-8 Ja 1 '15
Railway supply man's point of view. Ry R 56: 542-3 Ap 17 '15
Salesman's job requires special knowledge. F. Farrington. Metal Work 84:91-2 Jl 16 '15
Salesmanship. Ry R 56:370 Mr 13 '15
Salesmanship. Ry Ry 56:370 Mr 13 '15
Salesmen's training course of the American steel & wire co. C. R. Sturtevant. Ry R 57: 28 Jl 3 '15
Scientific handling of salesmen. Ind Eng 14: 385-91 O '14

Scientific handling of salesmen. Ind Eng 14: 385-91 O '14
Selling helps that have proved effective. il Metal Work 83:2-9 Ja 1 '15
Selling in the irrigation country. il Elec W 65: 1111-17 My 29 '15
Selling lamp-socket appliances; an analysis of eleven years' experience in marketing electric household devices in southern California. S. M. Kennedy. Elec W 65:1412-14 My 29 '15
Sheet metal product selling campaigns. R. Danzer. Metal Work 83:42+ Ja 1 '15
Should the salesman collect money? E. E. Whitehorne. Elec W 66:921-3 O 23 '15
Telephoning and letter writing. Ry R 56:603-4

Telephoning and letter writing. Ry R 56:603-4 My 1

Value of sales experience to the engineer. W: T. Price, Sibley J 30:11-13 O '15

What should a salesman produce? B. Daniels. Inland Ptr 55:230-1 My '15

Why some men fail and others make good. C. M. Smith. Metal Work 84:609 N 12 '15

Winning the co-operation of the jobber. Metal Work 83:38 Ja 1 '15 Word for and to industrial salesmen. C. E. Chapple. Am Gas Light J 103:89 Ag 9 '15 Word to managers about their men. W: Gould. Elec W 66:536-8 S 4 '15 Works school for salesmen. C. R. Sturtevant. Iron Age 95:1353 Je 17 '15

See also Advertising; Sales departments; Sales letters

Salicylic aldehyde
Effect of certain organic compounds on wheat
plants in the soil. F. W. Upson and A. R.
Powell. il J Ind & Eng Chem 7:421-2 My '15

Estimation of phenacetin and salol in admix-ture. W. O. Emery, G. C. Spencer and C. C. LeFebvre. J Ind & Eng Chem 7:681-4 Ag

Saloons. See Temperance

Composition of the salines of the United States; a correction. J. W. Turrentine. J Ind & Eng Chem 7:687-9 Ag '15 Origin of the Louisiana and east Texas salines. E: G. Norton. map Am Inst Min E Bul 97:93-102 Ja '15; Discussion. 101:1120-2 My '15

My '15
Salt and its relation to nutrition. P. G. Stiles.
Sci Am S 79:295 My 8 '15
Salt making by solar evaporation. W. C.
Phalen. il Am Inst Min E Bul 93:2249-65 S
'14; Discussion. 100:859-61 Ap '15
Solubility of mixtures of sodium and potassium chlorides in solutions of hydrochloric acid. W. B. Hicks. diag Am Chem Soc J
37:844-7 Ap '15
United States mining statutes annotated; salines and salt springs. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 1194-1214 '15

Salt Lake City, Utah

# Streets

Paving in Salt Lake City. Munic J 37:958 D 31

Saltpeter, Chile
American metallurgist in the Chile nitrate
field. Eng & Min J 99:252-3 Ja 30 '15

Chilean nitrate industry. M. R. Lamb. il Eng & Min J 99:811-15 My 8 '15

Drag-line machine for nitrate. J: G. Beck. il Eng M 49:429 Je '15

Salts colored by cathode rays. E. Goldstein. Sci Am S 79:318-19 My 15 '15

Sec also Chemistry Salvador, C. A.

# Commerce

American sheet metal products in Salvador. G. Harris. il Metal Work 83:800-1 Je 4 '15

Salvage Floating a stranded ship on air; refloating the steamship Zeeland. R. G. Skerrett. il Sci Am 112:84 Ja 23 '15

How compressed air saved the steamship Floriston, R. G. Skerrett, il diag Int Marine Eng 20:270-1 Je '15

Hunting for derelict ships, il Sci Am 112:606 Je

In quest of sunken treasure: spherical car for deep sea salvage work. C. L. Edholm. il Sci Am 112:250 Mr 13 '15

Raising the submarine F-4. J. A. Furer. il plan Eng N 74:880-4 N 4 '15
Refloating the steamship Zeeland by compressed air. R. G. Skerrett. Int Marine Eng 20:87-8 F '15

Salvage of the submarine F-4. J. A. Furer. il Sci Am 113:336-7+ O 16 '15

Salvage work on the Empress of Ireland. R. G. Skerrett. il plan diag Int Marine Eng 20: 60-2 F '15; Same cond. Sci Am 112:49 Ja 9

Wrecked dredge raised from timber bridge between dump scows, O. S. Proctor. il Eng Rec 72:303 S 4 '15

See also Wrecking

Salvage ships

Mother ship for submarines; a combined salvage and drydock vessel. R. G. Skerrett. diags Sci Am 112:430 My 8 '15
Salving sunken submarines, il diag Sci Am S

79:232-3 Ap 10 '15 Submarine to salve a submarine. R. G. Skerrett, il Sci Am 112:342 Ap 10 '15

Samoan islands

American Samoa. Sci Am 112:81 Ja 23 '15

Sample books. See Cloth-sample books

Sanatoriums

See also Convalescent homes; Tuberculosis, Hospitals and sanatoriums for

Sanatoriums, Municipal Chicago municipal tuberculosis sanitarium. C. A. Erikson. il plans Brickb 24:267-72, pl 151-7 N '15

Sand

ost of hydraulic sand and gravel mining. R. J. Borhek, Eng & Contr 43:573-4 Je 30 Cost

Economy effected in the use of river sand as a filter medium at Moline, Ill. Eng & Contr 43:236-7 Mr 17 '15

Effect of fineness of sand and of clay and loam

Effect of fineness of sand and of clay and loam on the strength of mortar. F. L. Roman. Eng & Contr 43:403-6 My 5 '15
Electricity in sand and gravel plants. il Elec R & W Elec'n 67:599-602 O 2 '15
Equipment and operation of plant at Waukesha, Wis. S. E. Bates. il diag Concrete Cem 7:165-8 N '15
How consistency and age affect strength of mortar. Eng Rec 72:484 O 16 '15
Poor sand the cause of the rapid disintegration of a sheet-asphalt payement. W. M.

Poor sand the cause of the rapid disintegration of a sheet-asphalt pavement. W. M. Cross. Eng N 73:621 Ap 1 '15 Railway sand experience. W. F. Carr. Elec Ry J 45:143 Ja 16 '15 River sand as a filter medium. L. A. Fritze. Am Water Works Assn J 2:390-2 Je '15 Sand for concrete and cement mortar should have jump in grading. R. H. McNeilly. Eng Rec 72:659-62 N 27 '15 Standard terminology for filter and concrete sands. Eng Rec 71:671 My 29 '15

See also Concrete-Aggregate

Analysis

Mechanical analyses of sands, P. Burgess, Am Water Works Assn J 2:493-500 S '15; Ab-stract. Eng & Contr 43:488-9 Je 2 '15; Dis-cussion, Am Water Works Assn J 2:500-14 S

Method of making mineralogical analysis of sand. C. W. Tomlinson. Am Inst Min E Bul 101:947-56 My '15

Standard apparatus and procedure recommended for sand analysis. P. Burgess. Eng Rec 71:644; Discussion. A. Hazen. 71:644-6 My 22 '15

Testing

Testing

Economic side of sand testing. C. M. Chapman and N. C. Johnson. il Eng Rec 71:734-7 Je 12 '15; Same. Sibley J 30:65-70 N '15

Field examination of concrete sand. diag Concrete Cem 6:303-5; 7:73-5 Je, Ag '15

Field examination of concrete sands. C. H. Fuller. Concrete Cem 7:156-7 O '15

Mechanical grading of concrete sand. G: P. Dieckmann. Concrete Cem 7:68-9 Ag '15

New instrument tests sands quickly in the field. il Eng Rec 71:821-2 Je 26 '15

Quality of concrete controlled by tests of sand. C. M. Chapman and N. C. Johnson. il Eng Rec 71:801-4 Je 26 '15

Rapid sand testing device. il Concrete Cem 7: 189-90 N '15

Safe concrete demands knowledge of nature

189-90 N '15
Safe concrete demands knowledge of nature of sands. C. M. Chapman and N. C. Johnson. il Eng Rec 71:771-4 Je 19 '15
Sand testing at Denver. E. B. Van De Greyn. Eng Rec 71:551 My 1 '15
Sand testing at New York in the laboratory of the Board of water supply. C: M. Montgomery. Eng Rec 71:551-2 My 1 '15
Wearing tests for sand and gravel, F. L. Roman. Good Roads n s 9:186-7 My 1 '15

Sand, Foundry Crane sand cutting machine. il Iron Tr R 56: 88-90 Ja 7 '15; Same. Foundry 43:77-9 F '15 How to get high core efficiency. H. M. Lane. Iron Age 96:684-6 S 23 '15 Molding sand. W. J. Keep. Foundry 43:380-1

Sand mixing plant for a large foundry. il Iron Age 94:1273-5 D 3 '14

See also Sand binders

Sand binders

Functions of sand binders, H. M. Lane. Metal Ind n s 13:421-3 O '15

Sand blast

and blast
How the Portage silica co. prepares its product to meet the requirements of the foundry trade. il Foundry 43:36-7+ Ja '15
How to operate the sand-blast efficiently.
J. M. Betton. Foundry 43:182-3 My '15
Improved sand blast plant, Bridgeport, Conn. il Foundry 43:374 S '15
Plant for sand blasting steel cars. diags Ry Age 59:397-8 Ag 27 '15; Same. Ry Age (Meched) 89:427-8 Ag '15
Safe sand blasting from an operating booth.
R. H. Parsons. diags Elec Ry J 44:1258-9 D 5
'14; Same. Ind Eng 14:460-1 D '14; Same. Eng M 48:748-9 F '15
Sand blast for marking glassware. G: Spitzer and L. S. Trachsel. diag J Ind & Eng Chem 7:426-7 My '15
Sand blasting steel cars. diags Ry Age (Mech

Sand blasting steel cars. diags Ry Age (Meched) 89:376-7 Jl '15; Same cond. Ry Age 59: 104-5 Jl 16 '15

Sand drying

Automatic sand dryer, il Elec Ry J 46:455 S '15

Drying sand in 7-yd. batches, diag Elec Ry J 46:193 Jl 31 '15 Oil burning sand dryer. F. G. Lister, diags Ry Age (Mech ed) \$9:407 Ag '15

Sand flow and flow Experiments on the flow of sand and water through spigots. R. H. Richards, and B. Dudley, jr. diags Am Inst Min E Bul 97: 67-72 Ja '15; Same cond. Met & Chem Eng 13:120 F '15; Discussion. Am Inst Min E Bul 101:1122-3 My '15

Sand handling
Notable floating sand and gravel plant, il Eng
& Contr 43:476-7 My 26 '15
Pumping and loading sand; with tables of
costs. A. E. Smith, il Elec W 66:467-8 Ag 28

Sand washing Continuous washer cleans 250 yards of sand a day, plan Eng Rec 72:611 N 13 '15

Large capacity sand and gravel v plant, il Eng & Contr 43:526 Je 9 '15 washing

San Diego, California
Panama canal and the ports of the Pacific.
A. J. Quigley. il map Eng M 48:643-50 F '15

Bridges

Concrete viaduct at San Diego, il Munic Eng 49:105-6 S '15

Panama-California exposition

At the Panama-California exposition at San Diego, il Sci Am 113:40 Jl 10 '15

Lighting at San Diego exposition, il Elec W 65:805-7 Mr 27 '15

Panama-California exposition. il Eng N 73: 801-2 Ap 29 '15

Panama-California exposition; Bertram G. Goodhue and the renaissance of Spanish-colonial architecture. C. M. Price, il plan Arch Rec 37:229-51 Mr '15

Public works

San Diego's municipal stadium. F. A. Rhodes. il plan Eng N 74:577-80 S 23 '15

Railroads

Terminal facilities at San Diego. il plans Elec Ry J 45:587-8 Mr 20 '15

Rapid transit

Handling traffic to the Panama-California exposition at San Diego. B. M. Warner, il map Elec Ry J 46:508-9 S 18 '15

Sectionalizing of electric railway feeders at San Diego. H. MacNutt. plan Elec Ry J 46: 496-9 S 18 '15

# San Diego, California-Continued

Water supply

Development plan for the water distribution system of San Diego, P. H. Thearle. Eng & Contr 43:174-5 F 24 '15
San Diego must save all available water. Eng Rec 71:714-15 Je 5 '15

Water supply for San Diego, Cal. Eng & Contr 44:sup21-2 Ag 25 '15 Water-works improvements at San Diego. diags Eng N 73:343 F 18 '15

Sandpapering

Construction of a drum sander. Bldg Age 37: 58 F '15

San Francisco, California

Panama canal and the ports of the Pacific. A. J. Quigley, il maps Eng M 48:654-7 F '15

Bridges

Mission street viaduct. A. J. Cleary. il plan Eng N 73:319-20 F 18 '15

Electricity supply

Interconnected systems serving San Francisco. il diags map Elec W 65:1356-82 My 29 '15

Harbor

Improvement of San Francisco's water front.
J. Newman, il diags Eng N 73:326-8 F 18 '15
Suspended fenders a feature of new reinforced-concrete piers at San Francisco.
F. G. White, il diags Eng Rec 71:231-3 F 20

Panama-Pacific international exposition

Panama-Pacific international exposition
Carborundum and cork exhibits at the Panama-Pacific international exposition, if Met & Chem Eng 13:455-60 Jl '15
Engineering features of the Panama-Pacific international exposition, G. L. Bayley, if Am Soc M E J 37:571-91, 696-8 O, D '15; Abstract, Eng N 74:845-6 O 28 '15; Discussion, Am Soc M E J 37:698-9 D '15
Engineering problems of the Panama-Pacific exposition, A. H. Markwart, if plan Eng N 73:329-36 F 18 '15
Exhibits at Panama-Pacific exposition; elec-

T3:329-36 F 18 '15
Exhibits at Panama-Pacific exposition: electric railway apparatus shown in both the palaces of transportation and of machinery. Elec Ry J 45:519-20 Mr 13 '15
General electric company's exhibits at the Panama-Pacific international exposition.

Elec Ry J 45:519-20 Mr 13 '15

General electric company's exhibits at the Panama-Pacific international exposition. G: W. Hall. il Gen Elec R 18:561-71 Je '15

Great exposition at San Francisco. il Metal Work 84:377-81 S 17 '15

Home electrical at the Panama-Pacific international exposition. D. C. Shafer. il Gen Elec R 18:552-8 Je '15: Same cond. Elec R & W Elec'n 66:1041-3 Je 5 '15

Industrial uses of gas at the Panama-Pacific international exposition. J: B. Redd. Am Gas Light J 103:156-7 S 6 '15

Juvors of exhibits at the Panama-Pacific exposition. Iron Age 95:1146-7 My 20 '15

Large-scale time-limited construction problems. E. P. Lesley. plan Iron Age 95:79-81 Ja 7 '15: Same cond. Eng M 48:891-3 Mr '15

Machinery exhibit compared with those of earlier expositions. il Power 41:250-6 F 23 '15

Manufacturers' exhibits at the Panama-Pacific exposition. Elec W 65:833-6 Mr 27 '15

Machinery exhibits at the Panama-Pacific exposition. Elec W 65:833-6 Mr 27 '15

Machinery exhibits at the Panama-Pacific exposition. Elec W 65:833-6 Mr 27 '15

Nation in perspective; Canada at the Panama-Pacific exposition. E: H. Hurlbut. il Sci Am S 80:17, 24-5 Jl 10 '15

Outline of exhibits of products of mechanical engineering. il Iron Age 96:142-9 Jl 15 '15

Panama-Pacific exposition. F. R. Low. il diags Power 42:180-4. 225-9. 261-6. 290-3, 341-3, 374-7, 444-7, 586-8, 730-3 Ag 10-S 28, 0 26, N 23 '15

Petroleum exhibit—San Francisco Panama-Pacific international exposition. February Exposition. Enternational exposition. February

23 '15
Petroleum exhibit—San Francisco PanamaPacific international exposition, February
20 to December 4, 1915. J Ind & Eng Chem
7:259-60 Mr '15
Printer's trip to the California expositions.
E. C. Andrews. il Inland Ptr 55:372-6 Je '15
Railway exhibit at the Panama-Pacific international exposition. 19 plan Ry R 56:685-8,
882-5 My 22, Je 26 '15

Railways and the California expositions, il Ry Age 59:461-4, 499-502 S 10-17 '15 Road and street exhibits at the Panama-Pa-cific international exposition, il Good Roads n s 10:154-9 S 4 '15

road cific international exposition.

n s 10:154-9 S 4 '15
San Francisco's notable engineering works, il
Eng Rec 71:229-30 F 20 '15
What the Panama-Pacific exposition means to
civil engineering and contracting. Eng Rec
71:619-20 My 15 '15

# Amusement features

Aeroscope a novel feature of Panama-Pacific exposition, il Eng Rec 71:423 Ap 3 '15 Aeroscope at the Panama-Pacific exposition, il Elec Ry J 46:31-2 J1 3 '15 Anchored airship: structural amusement device weighing 620 tons, il Iron Age 95:184 Ja 21 '15.

21 '15 Joy riding in the sky. il Sci Am 112:344 Ap 10 '15

## Architecture

Architecture

Color in architecture at the Panama-Pacific exposition. W: L. Woollett. il Arch Rec 37: 437-44 My '15

Four drawings. J. M. Rosé. Arch Rec 37: 228a-228h Mr '15

International Panama-Pacific exposition. il Sci Am 112:194-5 F 27 '15

Panama-Pacific exposition; plan and views. L: C. Mullgardt. Arch Rec 37:192-228 Mr '15

Panama-Pacific international exposition; buildings and their cost. G. K. Harrison. il Am Ind 15:16-20 Mr '15

Scene painting in architecture. W: L. Woollett. il Arch Rec 38:571-4 N '15

Texture and color at the Panama-Pacific exposition. F. E. Denivelle. il Arch Rec 38:562-70 N '15

Three impressions of the exposition. H. R.

Three impressions of the exposition. H. R. Mainzer; G: H. Gray; J. C. Levi. il Am Inst Arch J 3:467-70 N '15

## Auditorium

San Francisco's new exposition-civic auditorium, il Elec W 65:313 Ja 30 '15 Ventilation and other features of exposition auditorium at San Francisco, il Eng Rec 71: 237-8 F 20 '15

# Electric equipment

Electrical equipment of Panama-Pacific exposition. il diags plan Elec W 64:1241-7 D

Problems in electrical inspection at the Pa-nama-Pacific international exposition. G. A. Cleary. Elec R & W Elec'n 67:22-4 Jl 3 '15

Wiring and conduit work at the Panama-Pa-cific exposition. A. A. Willoughby. il diag Elec R & W Elec'n 67:365-8, 432-5, 472-4 Ag 28-S 11 '15

## Lighting and heating

Gas lighting at the Panama-Pacific international exposition. C. B. Babcock, il Am Gas Light J 102:234-5 Ap 12 '15

Illumination at the Panama-Pacific exposition. il Elec W 65:1383-6 My 29 '15

Illumination by ornamental luminous arc lamps at Panama-Pacific international exposition. Elec R & W Elec'n 66:1072-3 Je 5 '15

Illumination features at Panama-Pacific international exposition. A. A. Willoughby, il Elec R & W Elec'n 66:1032-4 Je 5 '15

Illumination of Panama-Pacific exposition.
G. L. Bayley. il Elec W 65:391-5 F 13 '15
Illumination of the Panama-Pacific international exposition. W. D'A. Ryan. il Gen
Elec R 18:579-93 Je '15; Same cond. Sci Am
S 79:376-7 Je 12 '15; Same cond. Illum Engr
8:305-9 JI '15
Panama-Pacific

Panama-Pacific exposition; committee report. Illum Eng Soc 10:534-7 no 7 '15; Same cond. Am Gas Light J 103:276 N 1 '15

Panama-Pacific international exposition at night; how the illuminating engineer uses light decoratively. H. M. Wright, il Sci Am 112:378+ Ap 24 '15

Panetheler illuminating effects at the Panetheler illuminati

Spectacular illuminating effects at the Pan-Pacific exposition. il Sci Am 112:180-1 F 20

# San Francisco-Panama-Pacific expos'n.-Cont.

New York state building

Facilitating timber design; tables and diagrams used in connection with the structural work on the New York state building. S. Diamant. Eng Rec 71:296-7 Mr 6 '15

Palace of horticulture

Pattace of hortcoulture

Design of 152-foot steel-framed dome. A. W. Earl and T: F. Chace. il diags Eng Rec 70:451-4, 482-4 0 24-31 '14; Same. Eng & Contr 42:314-20 S 30 '14

Designing a steel dome for the horticultural palace. A. W. Earl and T: F. Chace. diags Eng N 74:208-12 Jl 29 '15

Framing of the dome of the palace of horticulture. A. W. Earl and T: F. Chace. il diags Eng N 74:112-15 Jl 15 '15

Spectacular illuminating effects at the Pan-Pacific exposition. il Sci Am 112:180-1 F 20 '15

Palace of machinery

Abrasive products at fair, il Iron Tr R 57:487

Palace of mines and metallurgy

Palace of mines and metallurgy

Co-operative metallurgical exhibit at the Panama-Pacific international exposition. A. E. Wells and G. H. Clevenger. il Met & Chem Eng 13:743-5 O 15 '15

Films and models attract interest in United States steel corporation's exhibit. il Iron Tr R 57:402-3 Ag 26 '15

Panama-Pacific exposition, il plan Colliery 35: 657-63 Jl '15

Steel corporation at Panama-Pacific exposition. Colliery 35:389-90 F '15

United States steel corporation exhibit at the Panama-Pacific exposition. Iron Age 94:

Panama-Pacific exposition. Iron Age 94:

Tanama-Pacific exposition. From Age 94; 1425-6 D 17 '14
What the Panama-Pacific international exposition means to the metallurgical and chemical engineer. il Met & Chem Eng 13:339-40
My '15

# Palace of transportation

Motor car exhibits at the Panama exposition. C. L. Edholm. il Horseless Age 36:35-9 Jl 14

Transportation exhibits at San Francisco, il Elfec Ry J 15:504-5 Mr 13 '15 Transportation exhibits at the Panama expo-sition, W: S. Wollner, Ry Age 58:373-5 F 26 '15

#### Sewerage

Design of the sewerage system for the Pan-ama-Pacific international exposition. W: C. Willard, diags plan Eng & Contr 42:434-40 N

Plumbing at exposition. A. H. Markart. Metal Work 83:837-8 Je 11 '15

## State buildings

State buildings at Panama exposition, il Bldg Age 37:46-8 My '15

# Tower of jewels

Design and construction of the 435-ft, steel framed tower of jewels. F. S. M. Harris. il diags Eng & Contr 43:47-54 Ja 20 '15; Same cond. Eng N. 73:868-72 My 6 '15; Same cond. Eng Rec 71:112-16 Ja 23 '15

Exterior wooden framing of the tower of jewels. plans Eng & Contr 43:377-9 Ap 28 '15

# Transportation

Carrying the Panama-Pacific exposition visitors. il Eng N 74:770-1 O 21 '15
Transportation in the fair grounds; intramural railway, auto trains, rolling chairs and moving platform. il Elec Ry J 45:754-5 Ap 17 '15

# Water supply

Engineering features of the Panama-Pacific international exposition. G. L. Bayley. il Am Soc M E J 37:585-91 O '15; Abstract. Eng N 74:845-6 O 28 '15

#### Public works

Construction progress on the Twin Peaks tunnel. A. J. Cleary. il diags Eng N 74:869-71 N 4 '15

New San Francisco has risen from the ruins of 1906, il map Eng Rec 71:222-5 F 20 '15 San Francisco shore protection, diags Eng N 74:571 S 16 '15

San Francisco's notable engineering works. it Eng Rec 71:225-30 F 20 '15

# Rapid transit

Front-end fare collection improves service at San Francisco. H: T. Jones. il Elec Ry J 46:512-14 S 18 '15 How the exposition crowds are being handled at San Francisco. Elec Ry J 45:642 Mr 27

'15
Improvements in transit lines to handle exposition traffic. T. A. Cashin, il Elec Ry J 46: 518-19 S 18 '15
Municipal street railways. A. J. Cleary. il map Eng N 73:320-4 F 18 '15
Stockton street tunnel and Twin Peaks tunnel in San Francisco. A. J. Cleary. il map Eng N 73:314-17 F 18 '15
Time-table practice of the San Francisco. Ocklend terminal railways. J. S. Stiter Floro

N 73:314-17 F 18 '15 Time-table practice of the San Francisco-Oakland terminal railways, U. S. Sliter, Elec Ry J 46:521-2 S 18 '15 Two-car trains on 25 per cent grade, diags Elec Ry J 45:977-8 My 22 '15 Two-mile street railway tunnel at San Francisco, Eng Rec 71:47-8 Ja 9 '15

# Sanitary affairs

Garbage and refuse disposal and experiences with incineration at San Francisco. A. J. Cleary. il plan Eng N 73:301-4 F 18 '15

# Sewerage

an Francisco's sewerage system. A. J. Cleary, il diags maps Eng N 73:305-10 F 18

### Streets

Boulevard system of San Francisco. J. M. Owens, map Eng N 74:498-9 S 9 '15 Constructing rock tunnel of 50-ft. clear width, Stockton st., San Francisco. E. G. Tilton. il diags plan Eng & Contr 43:93-6 F 3 '15 Pavement problems and experience in San Francisco. J. M. Owens, il Eng N 72:1180-2

Francisco, J. M. Owells, it and D 10 '11'. San Francisco, the exposition city. il Good Roads n s 10:133-9 S 4 '15 Street pavements, roads and boulevards. A. J. Cleary. il Eng N 73:311-13 F 18 '15 Tunnel streets at San Francisco. T. A. Church. Munic J 38:767-8 Je 3 '15

# Water supply

Hetch Hetchy water supply project. Eng & Contr 43:sup22-3 Mr 31 '15
Hydraulic fill dam for an earthquake region: work on the Calaveras reservoir of the San Francisco water supply. Sci Am 112:154+ F

Present water-supply of San Francisco. Eng N 73:328 F 18 '15 Probable utilization of privately owned water

Probable utilization of privately owned water works at San Francisco in connection with new municipal supply. M. M. O'Shaughnessy. Eng & Contr 42:230-1 S 2 '14
Progress on Hetch Hetchy water-supply. il Eng N 74:378 Ag 19 '15
San Francisco's auxiliary water-supply for fire protection. A. J. Cleary. il plan diags Eng N 73:290-7 F 18 '15
San Francisco's future water-supply: Hetch Hetchy project. A. J. Cleary, il Eng N 73:298-301 F 18 '15

San Francisco municipal railways Annual report. Elec Ry J 45:1221 Je 26 '15

# Sanitary chemistry

See also Food-Analysis; Sewage disposal; Water purification

Sanitary engineering

convention of American public health association sanitary engineering section. Eng Rec 70:sup285-6 D 12 '14 Sanitary engineering in 1914. Engineer 119:31-2, 55-6 Ja 8-15 '15

Science of domestic engineering. T: J. Claffy. Dom Eng 70:7-8 Ja 2 '15

See also Filters and filtration; Heating; Municipal engineering; Plumbing; Public comfort stations; Refuse and refuse dis-

Sanitary engineering—Continued
posal; Refuse collection; Sanitation; Sewage
disposal; Sewerage; Street cleaning; Ventilation; Water purification; Water supply;
Water supply engineering; also American society of sanitary engineering

Sanitary engineering, American society of. See American society of sanitary engineering

Sanitary engineering, New Jersey society of. See New Jersey society of sanitary engineering

Sanitary engineers Duties of the pr uties of the practical sanitary engineer. J: Campbell. Metal Work 83:931 Je 25 '15

Sanitation

Construction camp, Elephant Butte, N. M. J. D. Graham. il diags map Eng N 72:1300-4

D 31 14
Country districts need plumbing regulations. F. K. Chew. Metal Work 84:659 N 19 '15
Economy in life saving; abstract from a report to the American society of municipal improvements. Munic J 39:616-17 O 21 '15
Improving sanitary conditions on the Ashokan reservoir watershed. G: G. Honness. Eng & Contr 44:213 S 15 '15
Master plumber's view of sanitation. R. A. Gibson. Metal Work 83:541 Ap 9 '15
National association of master plumbers sanitary committee's report. Dom Eng 72:112-13

tary committee's report. Dom Eng 72:112-13 Jl 24 '15

Old time sanitation problems. Metal Work 84: 607-8 N 12 '15

Relative values in sanitation. Eng & Contr 42:

Relative values in sanitation, Eng & Contr 42: 133-5 Ag 5 '14
Sanitary engineer's views on housing. T: J. Claffy. il Dom Eng 73:5-6, 45-6 O 2-9 '15
Sanitation of Iquitos, Peru. G. M. Converse. il Eng N 73:201 F 4 '15
Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:194-7, 224-6, 254-6, 284-6, 313-15, 338-40 Ag 14-S 18 '15

See also Disinfection and disinfectants; Dust removal; Factory sanitation; Foundry sanitation; Military hygiene; Plumbing; Refuse and refuse disposal; Sanitary engineering; Sewage disposal; Sewerage; Smoke prevention; Ventilation; Water purification; Water supply

# Santa Barbara, California

## Water supply

Progress of Santa Barbara water-supply pro-ject. K. Q. Volk. Eng N 74:1080-1 D 2 '15 Santa Fe railroad. See Atchison, Topeka & Santa Fe railroad

Santo Domingo. See Mines and mineral resources
—Santo Domingo

Saratoga Springs, New York Lincoln baths rival continental pools, il plan Metal Work 84:307-8 S 3 '15

## Sardinia

## Industries and resources

Calamine mines of Sardinia. C: W. Wright, il map Eng & Min J 100:625-8 O 16 '15 Gennamari mill. C. W. Wright, diags Eng & Min J 100:794-6 N 13 '15

form instruction for sheet metal workers. W: Neubecker, diags Metal Work 81:524-5, 681-2, 718-19; 82:457+, 615-16, 667-8; 83:498-9, 665-7, 810+ Ap 10, My 22-29, O 2, N 6, 20 '14, Ap 2, My 7, Je 4 '15

Saskatchewan

Scope of engineering reports and plans for sewerage and sewage disposal works in Saskatchewan. Eng & Contr 42:155-6 Ag 12

# Saskatoon, Saskatchewan

## Bridges

Concrete arch bridge at Saskatoon, il diags Eng N 73:434-6 Mr 4 '15

Saturated air. See Air

Saturators

New method and furnace for the determina-tion of the softening temperature of coal ash under fuel-bed conditions. A. C. Field-ner and A. L. Feild. il diags J Ind & Eng Chem 7:829-35 O '15

## Sault Ste. Marie, Michigan

#### Bridges

Double-leaf bascule railway bridge, il diags Engineer 120:246-7 S 10 '15

Saunders, William Lawrence, 1856-President Am. Inst. M. E. F. W. Iredell. por Eng N 73:389-90 F 25 '15 Sketch. por Eng M 50:209 N '15

Sausages

New casing for sausages. W. P. Cohoe, E. C. Fox, and A. J. Acton. Sci Am 112:235+ Mr 6 '15

## Savannah, Georgia

# Sanitary affairs

Refuse disposal at Savannah. E. R. Conant. Munic J 38:186-8 F 11 '15

#### Wharves

Design and construction features of the Ocean steamship co.'s terminal at Savannah. il plans Eng & Contr 44:343-4 N 3 '15

# Saw mills. See Sawmills

## Sawdust

Gas from sawdust. J Ind & Eng Chem 7:542-3 Je '15

Sawdust as fuel

Sub-bituminous coal and sawmill waste in producer plant. G: S. Wilson, il Power 42: 442-3 S 28 '15

Sawmills

awmills
Electricity in a modern saw mill. il Elec R & W Elec'n 66:290-2 F 13 '15
Electricity in the lumber industry. E. F. Whitney. il diags Am Inst E E Pro 33:1835-53 D '14; Discussion. 34:439-51 Mr '15
Sawmill engineering. J. E. Noble. plan Power 41:683-4 My 18 '15
Sawmill for form construction. H. E. Ketchum. il Eng N 74:986-7 N 18 '15

Abusing hack saws and cutter wheels, il Metal Work 84:238 Ag 20 '15
Automatic band saw sharpener, il Iron Tr R 56:666 Ap 1 '15
Band saw for light metal shapes, il Iron Age 96:85 Jl 8 '15
Brazing outfit for narrow band saws, F. W. Barrows, il diag Foundry 43:317-18 Ag '15
High-speed friction saw for shapes, il Iron Age 95:92 Ja 7 '15
Home-made saw for tubing, commutator bars, etc. R. H. Parsons, diags Elec Ry J 45:849
My 1 '15
New metal band saw, il Foundry 43:328-9 Ag '15

Recent high-speed hack saw machine. il Iron Age 96:519 S 2 '15; Ry Age (Mech ed) 89:544 O '15

Self-contained friction saw. il Iron Tr R 56: 327-8 F 11 '15

## Safety devices

Adjustable guard for circular saws. il Iron Age 96:877 O 14 '15 Adjustable saw guard. il Ry Age (Mech ed) 89:95 F '15

Scaffolding

caffolding
New scaffold hoist machine. diag Concrete
Cem 7:46 Jl '15
Safety staging hook. D. E. Charlton. diags
Eng & Min J 100:311 Ag 21 '15
Staging hangers for riveters on structural
work, il Eng & Min J 100:677 O 23 '15
Suspended scaffold for building construction.
diags Eng N 73:174-5 Ja 28 '15

See also Shoring and underpinning

## Scales

Automatic scales; abstract. F. J. Schlink. Am Soc M E J 37:488 Ag '15
Direct reading analytical balance. il Sci Am 113:325+ O 9 '15
Heusser multiple weight attachment for chemical balances. W. Heusser. il Eng & Min J 100:314 Ag 21 '15
Making a chemists' balance. F. W. Salmon. diags Power 42:617-18 N 2 '15

Railroad scale testing by the Bureau of standards. Ry R 56:553-4 Ap 24 '15

Scales, Track. See Track scales

Schenectady, New York

#### Sanitary affairs

Municipal garbage reduction plant, S. Gertz, il plan Eng. N. 73:820-2, Ap. 29, 45

# Sewerage

Schenectady's sewage disposal plant; nine shallow linhoff tanks and three acres of sprinkling filters, it plans Munic J 38:499-501 Ap 15 '15

Schenley park, See Pittsburgh Parks

Scherblus compensator. See Phase advancers

Scholarships and fellowships Research fellowships in the engineering ex-periment station. University of Illinois. Elec R & W Blee'n 65:1225 D 26 '14

School accounting

School accounting and costs, A. Hiller, J. Account 19:137 so Je '4s

School architecture. See Schoolhouses

School buildings. See Schoolhouses

School houses. See Schoolhouses

School hygiene

choof sanitation and students' health, W. H. Smith, Metal Work 83:601-3 Ap 23 '45

Sec also Schoolhouses-Heating and ventilation

School lighting. See Schoolhouses. Lighting

School ships. See Schoolships

Schoolhouses

choolhouses

Addison school, Cleveland, Ohio, and Walker school, Concord, N. H., views and plans. Erickh 21 pl 446 50 O '15

Brick a hoolhouse at Pickens, Miss, it diags plans Elda Age 37-27 31 O '15

Downers Grove kindergarten, Downers Grove, III., views Erickh 21 pl 103 a Jl '15

Edward Devotion school, Brookline, Miss, and voice school, Milton, Miss, views and plans. Brickh '4 pl 19 '21 F '15

Eight room brick schoolhouse, it diags plans 13 de Age 3, 4 S 8 Ag '15

Five examples of cantilevered auditorium balecomes diags sing Fig. 12 24 Jr. Ag 21 '15

contest darys Eng Ree . 1231 5 Ag 21 'La Francis W Parker open air school of S Diego; views and plan, Arch Rec 37;88-Diego: Ja '15

Modern schoolhouse, corridors and stanways W. H. Killiani, if plans Brickb "1.39-1" [

Modern schoolhoure, exposure and plan, W. H. Kilbani, il plan. Brickb 21.93 8 Vp. 45

Modern schoolhouse; special features, W. Kilbani d plan Brickb "4 14 1 Je 15

Modetn , choo hou e the class room. Kilham plan Brackb 24.3 8 Ja 45

Modern selection c. wardrobes, foilets, and reckil room: W. H. Killiam, il ding: Uylekh '1 202 Mr. ta

Notwood by the divide Norwood, Ohio; views and plan Princip "upletto Mr. To

Plumbing equipment in Jersey high school, il Metal Wests

Plumbing work in Kentucky high school il Metal Weng 81 1 H 30 11.

School building in Mir win and Connecticut. Am In t Area t Trace O'Ta

# Cost

Cost of schoolhous annual tinn, with a pro-posed unit bases in a new contents, E; C, Baldwin, Heat & V<sub>111</sub> 1 2 1, Je 'L,

Modern schoolhouse; cubage and cost. W. H. Kalbam, il plan Pres 1911 to My Tr

# Electric equipment

southern Idaho. H. B. Walker, Power 41: Government

# Heating and ventilation

Chicago ventilation communicate if report if Metal Work \$8.63° as Ap 20.745

ownward ventilation in a Rockford, Ill-schoolhouse, with discussion (\* 1° Beery il plans Am Soc Heat & V E 19763 81 '13 Downward 111. Experiment in school room ventilation with reduced air supply through individual duets; with discussion. F; Bass. il Am Soc Heat & V E 19:328-60-73 Experiment in ventilating a schoolroom, il Dom Eng 73:38-41-O 2-745

Experiments on lumidifying air at the Oliver Wendell Holmes school; with discussion, Wendell Holmes school; with discussion, C: F. Eveleth, plans Am Soc Heat & V E 19:109-27 '13' catting a country school house in Maine.

Heating a country school house in Medical E. B. Harvey, plans Metal Work 82:735 D

Heating a two-story brick schoolhouse; leating a two-story brick schoolhouse; de-scription of a gravity steam system. Il plans Isldg Age 37:53-5 Ja '15 eating and ventilating Cos Cob school, Greenwich, Conn. Il plan Metal Work 84: 637-8 N 19 '15

63.-8 N 19 4.
Heating and ventilation of schoolhouses, H. L.
Alt. plans Brickb 24:165-8 JI '15
How to figure school house ventilation. Dom
Eng. 72.228 Ag 21 '15
Plumbing and heating in new Lebanon school,
Greenwich, Coun. il plan Metal Work 81:1314 JI 2 '15

Recent tests on recirculation of washed air, G. L. Larson, il Metal Work 81:675-7 | N 26 '45

Recirculating of air in a school in Minneapolis, F; Bass, Heat & Ven 12:27-30 Mr '15.
Recirculation of air for schools, I, N. Evans, Heat & Ven 11:46-53 Je '14; 12:43-5 Ap '15.
Report of the committee on schoolroom ventilation. Am See Heat & V E, 19:104-8 '13.
Space requirements for boilers of various types in school buildings, T, W. Treynolds, diags Heat & Ven 12:17-19 Jl '15.
Standard details of heating and ventilating work, F, G. McCann, diags plans Metal Work 81:31-3, 125-6, 231-3, 302-3, 363-4, 421-4, 494, 511+, 606-7; 82:273-4, 460, 706-7; 83:119-a0, 281-2 Ja 2, 16, F 6, 20, Mr 6, 20, Ap 3-10, My J, S J, O 2, N 27-14, Ja 22, F 19 '15

# Lighting

Safeguarding the eyesight of school children, M. Lucktesh, bibliog il Illum Eng Soc 10: 181-202 no 2 45; Abstract, Illum Engr 8:297-

School room lighting, F. L. Godinez, il Arch & Bldg, 1,:365 7, 400-2 O-N '15

# Toilet rooms

Modern plumbing equipment in Cos Cob school, Greenwich, Conn. il Metal Work 84:678 | N 26 '15

Modern schoolhouse; wardrobes, toilets, and special rooms, W. H. Kilbam, diags Brickb 74:60 | Mr ' L. Modern toilet room in public schools, J. Gra-ham, plans Dom Eng 70:332-4, 402-5 Mr 13, 27 '15

Phinbing equipment of Montckir, N. J., high school, Il plan Metal Work 84;483-4+ O 15 '15 Rational design of sanitary equipment, il plan Metal Work 84;587-8 N 5 '15

Schoolhouses, Portable

Chicago adopt portable schoolhouse idea, il plan Metal Work 84 404 5 8 24 15 Portable schoolhouses in Chicago, il diags Bldg Ame 3, 37 40 My 15

Schools. See Correspondence schools and control Evening and continuation schools, Trade schools

Schools and shops, Cooperation of Cooperation between employers and the schools W: B. Hunter, Am Soc M E J 37 278-9 My '15

Co operative technical schools meet present needs, F. E. Ayer, Eng N. (1969-61 D 2 To Learning through doing, Ser Am 112:624 Je

McComb apprenticeship plan, Illinois Central railroad, H. N. Seney, Ry R o7:619-20 X 13

Practicing engineers and industrial education.

18; G. Bouser, Eng N. 72:113; 4 D 3 '11 Pype of the new apprentice but at the Beyorly, Mass., industrial school. W. A o'theary, Am Ind 15:26-7 My 45

Schoolship Grandduke Fredrich August, Int Marine Eng 20:515-46 N '45

# Schoop metal spray. See Metal coating

Cience
Common aims of science and humanity, A.
Schuster, Engineer 120:252-3 S 10 '15
Emotionalized science, Sci Am 112:172 F 20 '15
Future of science, Sci Am S 79:370-1 Je 12 '15
German science; abstract, Ind Eng 14:440 N '14
Plea for scientific methods, Sci Am 112:62 Ja
16 '15
Dolltical impacts.

Political importance of science. Sci Am 111: 518 D 26 '14
Recent significant developments in science and engineering. Sibley J 29:103-9 Ja '15; Same. Sci Am S 79:82 F 6 '15
Science in the daily press. R. A. Gregory. Illum Engr 8:203-7 My '15
Scientific solidarity in wartime. Sci Am 112: 396 My 1 '15

See also Chemistry; Geography; Geology Inventions; Mathematics; Radioactivity Scientific expeditions; Technology; Weight and measures, Zoology Geology;

#### Dictionaries

Wanted a polyglot scientific dictionary, Sci Am 112:336 Ap 10 '15

# Terminology

Science and lexicography. Sci Am 112:78 Ja

#### Science and state

Awards for new truth, Sci Am 113:392 N 6

Practical devices and the lack of capital, C: E. Duryea, Sci Am 113:119 Ag 7 '15

# Scientific American

eventy years of the Scientific American, il Sci Am 112:540-3, 546 Je 5 '15

Scientific American medal Sixth award of the Scientific American medal for safety devices, W: H. Tolman, il Sci Am 112:174 F 20 '15

Scientific education
England's tardy recognition of applied science, W. R. Whitney, J Ind & Eng Chem ence, W. R. 7:819-22 O '15

Scientific expeditions
Roosevelt-Rondon scientific expedition, L. E.
Miller, il Sci Am S 79:248-9, 268-70 Ap 17-

# Scientific management

Abolition of scientific management in govern-

ment shops. L. W. Moffett, if from Tr R 56:963-6+ My 13 '15
Application of engineering methods to the problems of the executive, director and trustee. H. Godfrey. Am Soc M E J 37:334-40

Je 15 Applying scientific management. H. K. Hath-away. Iron Tr R 57:739-42+, 787-93 O 14-21 '15; Same. Foundry 43:440-4, 502-7+ N-D '15 Brief on management; testimony of Carl G. Barth before the Federal commission on in-dustrial relations. Iron Age 96:1065-6 N 4

Dusiness men to investigate Taylor system.

Iron Age 95:951-5 Ap 29 '15
Construction management. S. E. Thompson and W. O. Lichtner, it diag. W. Soc. E. J. '9: 109-29 F '15; Same cond. Eng & Contr 43: 428-32 My 12 '16; Discussion. W. Soc. E. J. 20:129-51 F '15

Co-operative spirit and industrial peace, F. B. (libreth and L. M. Gilbreth, Iron Age 96: 528-30 S 2 '15

Criminal speeding-up system—and some facts. W: Crozier. Am Ind 15:30-1 Ja '15
Departmental work planning system at Portland, Ore. F. P. Maize. il Elec Ry J 46:565-7
S 18 '15

Economic choice of shovels for handling dif-ferent classes of material, C. W. Hartley, Eng & Contr 43:302-3 Mr 31 '15

Executive's problem; an analysis of what is involved in different forms of management. G: D. Babcock, Iron Age 96:419 Ag 19 '15

First principles of shop planning, F. M. Perkins, il Foundry 43:366-72 S '15

Government shop management. W: Crozier. Iron Age 96:954 O 21 '15

Individual in modern management, F. B. Gilbreth and L. M. Gilbreth, Iron Age 96:802-4 O 7 '15; Excerpts (Practical side of scientific management). Metal Work \$45630 N 12

Labor problems in scientific management. Iron Age 91:1369-72 D 10 '14 Labor union, scientific management and the government, Ind long 15:6 Ja '15 Labor vs. scientific management and the government, Ind long 15:6 Ja '15 Labor vs. scientific management. R. T. Kent. Iron Tr R 56:471-5 Mr 1 '15 Literature of industrial management. J. R. Dunlap. Eng M 49:163-6 My '15 New certificate of character for manufacturers. R. G. Valentine. Ind Eng 15:40-3 F '15 Operating a foundry on a scientific basis: a large Detroit shop specializing in aluminum castings. F: A. Parkhurst. il Foundry 43: 413-7, 479-86; 41:21-6, 53-8 N '14-F '15 Principles of scientific management. F: W. Taylor, Ind Eng 15:85-9 S '15 (to be cont) Rider to army bul, Iron Age 95:130 F' 18 '15 Riders to appropriation bills not to work as management opponents desired. Iron Age 95: 593-4 Mr 11 '15 Scientific bandling of salesmen. Ind Eng 14: 385-91 O '14

385-91 O 14 Scientific management and the labor problem. R. T. Kent. Ind Eng 14:418-21 N '14 Scientific management for the factory of moderate size. D. T. Farnham. Eng M 50:46-51

O '15
Scientific management in a cotton weave room.
Textile World 49:526-8 Ag '15
Scientific management in the office. R. T.
Kent. Iron Age 95:82-6, 142-4 Ja 7-14 '15
Scientific management under the X-ray. Iron
Age 96:1236-8 N 25 '15
Status of scientific management in the war
and navy department plants. Eng & Contr
43:596 Je 9 '15
System and its abuse It Colder Iron Age

System and its abuse. J: Calder. Iron Age 96:1043-4 N 4 '15

Taylorism and the bonus system. W. L. Myles. Mach 21:404-5 Ja '15

Three position plan of promotion. F. B. Gilbreth and L. M. Gilbreth. Iron Age 96:1057-9 N 4 '15

Ultimate type of management. J: Deventer. Eng M 49:394-401 Je '15

Value of preliminary sketches and layouts in production work. A. A. Dowd. diags Horse-less Age 36:232-4 S 1 '15

Wage systems of scientific management. Ind Eng 15:45-50 F '15

long 15:45-50 F '15

\*\*Rec also Accounting; Lonus system; Cost accounting; Efficiency, Industrial; Employees; Factory management; Foundry management; Machine shop management; Mine management; Motion study; Office management; Printing offices Management; Purchasing; Railroads Management; Reords; Routing systems; Shop management; Stores systems; Task system; Time study

Scientific research and Stronomical and mathematical research, Prof. Schlesinger, Sci Am S 79:168 Mr 13 '15

German colonies as outposts of science. Sci Am 111:450 D 5 '14

Knowledge and research, R. W. Raymond, J Ind & Eng Chem 7:328-33 Ap '15

National physical laboratory: annual report. Engineer 119:623-4 Je 25 '15

Rational research. Sci Am 112:376 Ap 24 '15

Relation of physical science to the develo-ment of engineering, R. C. Gibbs. Sibley 29:129-32 Ja '15

Science in the war and after the war. J. A. Fleming, Sci. Am S. 80,335 9 (17) [17] Same cond. Engineer 120:336-7 O 8 '15

See also Industrial recent in Laboratories

Scientific terminology. See Science-Terminology Scientists

Random reflections on artists and scientists, Sci Am 112:229 Mr 6 %.

# Scieroscope

Standardization of scleroscope observations. J. J. Ralph. diags Mach 22:52-3 S '15

Scotch tweed. See Tweed

#### Scotland

# Public works

Institution of civil engineers: presidential address, B; H, Blyth, Engineer 118:438, 458-9, 514-16 N 6-13, 27 '14

Scows

Concrete scow has withstood 4½ years' hard rervice. Eng Rec 72:71 Jl 17 '15 Drill boat which lifts itself clear of the water. il Eng N 72:1317 D 31 '14

Scrap metal

Classification of old metals, Foundry 43:312-13 Ag La, Same, Metal Ind n a 13:143 Ap '15 First principles of economy; handling railroad cerap. By R 56:143-5 Mr. 27 '15 Foundry use of non-ferrous scrap metals, F. M. Perkins, il Metal Ind n s 13:140-2, 194-7 Ap-

Handling and sale of ear wheel, rails and crap from J. P. Alexander, Elec Ry J 45; 21.6 Ja 30 '15

Manganese-bronze, J. B. Rhodes. Metal Ind

n s 13:462 N 15 Master blacksmiths' convention; discussion of reclaiming scrap. Ry Age (Mech ed) 89:473

Modern reclamation plant and scrap yard. Ry R 57:281-4 Ag 28 '15 New press for baling scrap metal. il Iron Age 95:1059 My 13 '15

95:1059 My 13 '15
Our big scrap heap. Foundry 43:232 Je '15
Philadelphin scrap prices, 1805 to 1911. Iron
Ame 9: '12 Ap 1 | 15
Reclamation of scrap on the Great Northern.
il Ry Age 58:967-70 My 7 '15; Same. Ry Age
(Mech ci) 9:30. Je 1.
Recovery of secondary metals, J. P. Dunlop.
Metal Work 84:425+ O 1 '15
Recovery of secondary metals in 1914. Foundry 43:313-15 Ag '15
Rerolling rall steel. C. A. Tupper, Iron Age.

dry 43:313-15 Ag '15
Rerolling rall steel, C. A. Tupper, Iron Age 96:471 Ag 26 '15
Sale of emp metals, E. J. Yungbluth, Elec Ry J. L. J. J. F. '9 '11.

Sales of scrap metals. J. P. Alexander, Elec

Sales of scrap metals, J. F. Alexander, Elec-lic J 14, 192 2 Ja 3 Th Scrap and scrap classification; Railway store-keepers' association committee report, Ry Age 58:1039 My 21 '15; Same, Ry R 56:689-90 My 22 '15

Scrap and scrap classification; Railway store-keepers' association committee report. Ry Apr. (Mech. ed.) 82:285 Jc. '15

Scrap-handling plant of Boston & Albany rail-road, il Eng Rec 70:651-2 D 12 '14; Ry Age 58:745-6 Ap 2 '15

Serap prices at Chicago, 1903 to 1914. Iron Age 95:15 Ja 7 '15

Standard old metal classification. Iron Age 94:1516-17 D 31 '14

Welding up scrap nickel anodes, il Elec R & Welding up scrap nickel anodes, il Elec R & Welcin 66:1210-11 Je 26 '15; Same, Eng & Min J 100:19 Ji 3 '15; Same, Foundry 43:283-4 Jl '15; Same, Met & Chem Eng 13: 453-4 Jl '15; Same cond. Iron Age 95:1392 Je 24 '15; Same abr. Metal Ind n s 13:297 Jl

There classifying scrap paid; Fort Wayne & Northern Indiana traction co.'s tests. A. W. Redderson. Elec Ry J 46:957-8 N 6 '15 Where See also Metal waste; National scrap iron

and steel as occution

Scrapers

Bagley scraper for gravel mining in Alaska. L. H. Eddy, il Eug & Mm J 100:257-8 Ag 14 '15

Power scraper for back there trenches, il Eng & Contr 44:215-16 S and La

Screen doors

Screen door which sage, dec + Eldg Age 37:53-4 Ag '15

Screening

Handy grizzly for heavy work. K. C. Browne. diag Eng & Min J 98:1045 D 12 '14

Portable screening plants for sand and gravel. il Concrete Cem 5:263-4 D '11

See also Sewage disposal comming

Screens

Circulating water screens, H. Addison, diag Engineer 120:202 Ag 27 '15

Clarifying sewage by fine screens. K. Allen-il diags Munic J 39:143-5, 186-8, 220-2 Jl 29-Ag 12 '15

Ag 12 '15 ng screens at Delray. C. F. Hirshfeld, il diag Power 41:333-4 Mr 9 '15 Notes on screens for gravel washing and screening. W. H. Wilms, diag Eng N 73: 440-1 Mr 4 '15; Same cond. Ind Eng 15:80-1

Power operated multi-basket strainer. il Iron Age 96:1055-6 N 4 '15; Elec W 66:1108 N 13

Revolving screens for sand, gravel and crushed stone. Il Concrete Cem 6:313-14 Je '15 Riensch-Wurl sewage screens, Brooklyn. Il Eng N 73:1224-5 Je 24 '15 Rotary screens remove macro-organisms from the screens of the scree

Denver's lake water supply. il Eng Rec 72: 291-2 S 4 '15 treatment in Germany by Sewage means

sewage treatment in Germany by means of the Riensch-Wurl rotating screen. Endris. Il Eng & Contr 42:273-6 S 16 '14 Size of products from square and round hole screen. II. A. Roester. Eng & Min J 99: 493 Mr 13 '15

493 Mr 13 '15

Specifications for uniform screens for soil tests. Eng N 73:267 F 11 '15

Steam shovel digs gravel for plant at Coleman, Ill. R. P. Duffy. Concrete Cem 7:170 N '15

Tests for screen selection. F. Meinke, jr. Eng & Min J 100:762-4 N 6 '15

Traveling water screens. H: J. Edsall. il Power 42:123-4 Jl 27 '15

Wood screening machine, il diag Eng & Min J 100:887-8 N 27 '15

Screw driving machines

Machine for removing and driving screws. il

Iron Tr R 56:1115 Je 3 '15; Iron Age 95:1225 Iron Tr R 56:1115 Je 3 '15; Iron Age 95:1225 Je 3 '15 Special multiple screw driving machine. Il Iron Age 95:495 Mr 4 '15

Screw machines rrew machines
Automatic machine development, R. E. Flanders, il Iron Tr R 57:885-93+ N 4 '15; Abstract. Iron Age 96:1179 N 18 '15
Automatic shut-off on B. & S. automatic screw machine. E. Whitney, diags Mach 21:

Britain six-spindle automatic screw machine. il diags Mach 21:751-4 My '15; Iron Age 95: 947-8 Ap 29 '15; Iron Tr R 56:919 My 6 '15 Cleveland model G automatic screw machine. il diags Mach 21:419-21 Ja '15 Double-head automatic for finishing roller bearing rollers, il diag Mach 21:965 Ag '15 Forming a wire in the automatic screw machine. E. Whitney, diags Mach 21:294-5 D '14

Hardening high speed screw machine tools. R. A. Millholland. Iron Age 96:745 S 30 '15 Index drilling and tapping attachment for Brown & Sharpe automatic screw machine. W. F. Gradolph. il diags Mach 21:289-90 D 14

Machining castings in the automatic screw machine. E. Whitney. diags Mach 21:381-2 Ja '15

Making aero motor pistons: tool equipment used on Cleveland automatics. D. T. Hamil-ton. il diags Mach 21:300-2 D '14

Making fuse parts on Brown & Sharpe automatic and hand screw machines, diags Mach 21:647-8 Ap '15

Perkins automatic screw machine, il Mach 21: 295 D '14

Reciprocating thread rolling machine, il Iron Age 94:1283 D 3 '14

Simple magazine attachment. E. Whitney. diags Mach 21:812 Je '15

Simultaneous internal and external forming on screw machine. C. Lamoreaux, diags Mach 21:747-8 My '15

See also Machine tools

Screw propellers. See Propellers

Screw spikes. See Spikes (railroad)

Screw threads
Conflict of one-half-inch thread pitches. J: A.
Wood. Mach 22:148 O '15

Pitch diameter of 90-degree threads, H. Smart. diag Mach 21:1011 Ag '15

Screw threads - Continued

Points on making and using threading chasers, diags Mach 21:1015-16 Ag '15 S. A. E. standard threads, Mach 21:459 F '15 See also Pipe threads; Thread cutting machines

Screws

Grews
Fastening timber guard rails with lag screws.

diag Ry Age 59:125 Jl 16 '15
Modern plant for rolling iron: St. Louis screw
co. H. C. Estep, il diags plans Iron Tr R
57:82-9+ Jl 8 '15
Tap and screw limits, diags Mach 22:54-7 S
'15

See also Screw machines; Screw threads; Thread cutting machines

Failure of the hull of the Sea Call. il Met & Chem Eng 13:384 D 1 '15
Three-masted auxiliary schooner yacht Sea Call. il Sci Am 112:623 Je 26 '15

Sea shells

Use of beach shells as concrete aggregate. Concrete Cem 7:72-3 Ag '15

Sea walls

ea walls
Curbing the sea at Galveston, H: M. Robert, il Sci Am 113:268 S 25 '15
Curved overhang suggested for Galveston seawall, E. L. Corthell, Eng Rec 72:426 O 2 '15
Design of shore-protection works, R. Bennett, diags Eng N 74:98-101 Jl 15 '15; Abstract, Eng M 50:466-8 D '15
Effect of Galveston storm on seawall and causeway, R. P. Babbitt, Eng N 74:427 Ag 96 '15

causeway. R. T. Baubitt. Fig. X (13.17 As 26 '15 Frisco seawall at Cape Girardeau, Mo. il Ry Age 58:889-90 Ap 23 '15 Galveston adopts plan to strengthen its waterfront defense against future storms. il diag Eng Rec 72:576-7 N 6 '15 Galveston survives hurricane. il map Eng N 74: 424-6 Ag 26 '15 Galveston's sea-wall checks hurricane's devastation. E. B. Van de Greyn. il diags Eng Rec 72:271-5 Ag 28 '15 Instance of the parabolic reflector reversed; Galveston sea wall as a sound reflector. L. F. J. Zerbee. Sci Am 113:235 S 11 '15 John B. Hawley confirms view that sea-wall saved Galveston. Eng Rec 72:276 Ag 28 '15 Storm damage to sea walls on California coast. il diags Eng N 73:720-1 Ap 15 '15 Toronto breakwater to curb 10-foot waves.

Toronto breakwater to curb 10-foot waves. diags Eng Rec 70:694-6 D 26 '14 See also Bulkheads

Sea water Irrigation with fresh water from the sea, E. J. Moynihan, Sci Am S 79:84-5 F 6 '15

Seaboard air line Annual report, map Ry Age 57:1171-2, 1209-10 D 25'14

Organizing the supply department on the Seaboard air line. H. C. Pearce, Ry Age 58:45-7 Ja 8 '15

Seals

Insoluble seal for letters, Sci Am S 79:138 F 27 '15

Seamanship. See Navigation

Seamen's bill

Light on the seamen's bill. Sci Am 113:58 Jl

Seamen's church institute, New York Plumbing system in Seamen's church in tute, il Metal Work 83:412-14 Mr 19 '15 insti-

Searchlights

Conditions determining the candle-power and steadiness of large current arcs for searchlights. H. Ayrton. Illum Engr 8:78-81

Constituent parts of a searchlight, testing etc. C. S. McDowell, il Am Inst E E Pro 34:195-208 F '15; Abstract and discussion. Elec R & W Elec'n 66:393 F 27 '15; Abstract and discussion. Elec W 65:526-7 F 27 '15; Discussion, Am Inst E E Pro 34:2975-83 D 15

Electricity in marine work, M. W. Day, il Gen Elec R 18:509-11 Je '15

Electricity in the war. il Elec R & W Elec'n

67:76-8 J1 10 '15
Experimenting with searchlights. Sci Am S
80:23 J1 10 '15

80:23 Jl 10 '15 Linemen's non-electric and electric search-lights, il Elec Ry J 45:472 Mr 6 '15 Method for determining the range of search-lights, A. Blondel, Illum Engr 8:85-90, 153-9 F, Ap '15 Motor searchlights with the British-French

otor searchlights with the British-French forces, il Elec R & W Elec'n 67:239 Ag 7

New searchlight for use with dry cells. il Elec R & W Elec'n 67:209 Jl 31 '15
Portable searchlights for fire departments. L. C. Porter and P. S. Bailey, il Gen Elec R 18:1144-5 D '15
Practical and theoretical notes on projectors. A. P. Trotter. Illum Engr 8:82-4 F '15
Searchlamp mounted on truck for British navy, il Elec W 65:1262 My 15 '15
Searchlight automobile for the Italian army, il Sei Am 113:273+ S 25 '15
Searchlight for the United States navy. H. T. Wade. Sci Am 112:382 Ap 24 '15
Searchlights and the visibility of distant objects. Sci Am S 80:87 Ag 7 '15
Searchlights; some notes on their scientific development and practical applications; with discussion. P. G. Ledger, il diag Illum Engr 8:53-76 F '15 discussion, P 8:53-76 F '15

8:33-76 F '15 Searchlights; the more usual electrical sys-tems of operation. J. F. Crowley. Illum Engr 8:159-60 Ap '15 Searchlights; their scientific development and practical applications. Illum Engr 8:41-3 F

Unusual lighting effects at night pageant. il Elec R & W Elec'n 67:332-4 Ag 21 '15

Watching the enemy from the fighting line. il Sci Am S 80:88-9 Ag 7 '15

Searles Lake, California
Searles Lake patent protest. Eng & Min J 99:
334-5 F 13 '15

Seashore

Ripple marks; a study of water action on the seashore. C. Epry. il map Sci Am S 80:188-91 S 18 '15

Seaside resorts

Collection and disposal of sewage at seaside resorts, M. A. Pugh, il diags Eng & Contr 43:175-9 F 24 15

Seattle, Washington

Architecture

L. C. Smith building, Seattle, Wash, il plan Arch & Bldg 46:471-5 D '14

Harbor

Panama canal and the ports of the Pacific. A. J. Quigley. il map Eng M 48:811-16 Mr '15 Port development at Seattle. P. P. Whitham. il diags map Eng N 73:476-81 Mr 11 '15

Lighting

Seattle municipal lighting plant. W. L. Kidston, il plans Power 41:182-5 F 9 '15

Manufacturers' exhibit and exchange

Seattle industrial exhibit, il Iron Age 96:194-5 Jl 22 '15

Ordinances, etc.

Ordinances regulating street excavating—re-placement by city. Munic Eng 48:116-18 F

Public works

ea water to rise into fresh-water canal. Whitham, il map Eng N 74:246-7 Ag 5 '15

Rapid transit

Double trolley system in Seattle. H. J. Kennedy. il Elec Ry J 45:128-9 Ja 16 '15

Municipal ownership in Seattle. Elec Ry J 44: 1311 D 12 '14

New cars of Seattle municipal railway. H. J. Kennedy. il diag Elec Ry J 44:1284-6 D 12 '14

Sewerage

Sewer gagings and maximum flow in a Seattle outfall. H: D. Silliman. map Eng N 74:832-4 O 28 '15

Seattle, Washington -Continued

Water supply

Leakage from Cedar lake reservoir, Seattle water-supply. C: E. Fowler, il map plan Eng N 73:112-15 Ja 21 '15

Seawalls, See Sea walls

Secondary batteries. See Storage batteries

Secondary metals. See Scrap metal

Secret reserves. See Accounting

Securities

ook accounts as security for loans. E. J. Buckley. Metal Work 83:237 F 5 '15 Book

See also Bonds; Negotiable instruments; Railroads—Securities

Seeds

Occurrence and significance of manganese in the seed coat of various seeds. J. S. Mc-Hargue. Am Chem Soc J 36:2532-6 D '14 Seed supply and the war. G. E. Mitchell. il Sci Am 111:488 D 12 '14

Evaporation and seepage from irrigation res-ervoirs, K. A. Heron, il Eng N 74:294-5 Ag

12 '15
How to express seepage losses from irrigation canals, S: Fortier, Eng N 73:1128-9 Je 10 '15
Losses in concrete and mortar lined canals, H. D. Newell, Eng Rec 72:21 Jl 3 '15; Same abr. Eng & Contr 44:22 Jl 7 '15
Seepage develops at Cedar river reservoir, Eng Rec 71:62 Ja 9 '15
Transmission losses in unlined irrigation channels, S: Fortier, Eng N 73:1060-3 Je 3 '15

Selby smelter commission

Report of the Selby smelter commission. J Ind & Eng Chem 7:41-5 Ja '15; Same cond. Eng & Min J 98:1075-8 D 19 '14

Selenium

Constructing selenium cells. Sci Am 112:201

Construction of selenium cells. S: Wein. Sci Am 112:403 My 1 '15 Estimation of selenium in sulfur, W. Smith. J Ind & Eng Chem 7:849-50 O '15 Galvanic cell that reverses its polarity when illuminated. A. A. Campbell. Sci Am S 80:66

Mechanical eye bringing sight to the blind; a description of the crystal phonopticon. L. E. Dodd. il Sci Am 113:128+ Ag 14 '15 Selenium cell making. Sci Am S 79:187 Mr 20

Selenium in the production of colored glass. S: Wein. Sci Am 112:361 Ap 17 '15

ellers, Matthew Bacon Sketch, por Eng M 50:200-1 N '15

Selling. See Salesmen and salesmanship

Selvages

Rolled selvages. Textile World 49:666-7 S '15

Semaphores

Semaphore with automatic whistle to direct street traffic in San Francisco, il Elec Ry J 45:671 Ap 3 '15

Semi-carbazide

Action of monochloroacetic acid on semi-car-bazide and hydrazine. J. R. Bailey and W. T. Read. Am Chem Soc J 36:1747-66 Ag '14

Septic tanks

Another septic-tank decision, Eng N 74:667 S 30 '15

Concrete septic tanks for country houses. diags Concrete Cem 6:sup91 Ap '15 Construction and operation of septic tank. W. H. Chapman. diag Metal Work 83:636-8+Ap 30 '15 Construction of tank.

Construction of concrete septic tanks, P. H. Wilson, diags Metal Work 82:763+ D 11 '14 Design of sewage system for residences. D. W. Bingham. Metal Work 82:730 D 4 '14

Explosion in Pasadena septic tank, il Metal Work 81:464 O 8 '15

Septic tank and sewage disposal, B. J. Ashley, Metal Work 84:557 O 29 11.

Septic tank and sewage disposal, Metal Work 84:652-3 N 19 '15

Septic tank explosion at Florence, M. Maffitt. Eng N 73:410-11 F 25 '15 at

Septic tank for underground latrine, H. G. Pickard, diag Eng & Min J 99:149 Ja 16 '15 Sewage disposal by means of the septic tank. J. Graham, diags Dom Eng 73:198-200 N 13 '15

Sewage

ewage disposal by septic tank systems. W. H. Chapman, diags Dom Eng 71:94-6 Ap 24 15

Sewage disposal for country homes. diags plans Bldg Age 37:63-5 S '15 Sewage disposal in rural country districts. B. D. Colby. Metal Work 84:341-3 S 10 '15 Sewage disposal methods in rural districts, diags Metal Work 83:672-5, 693-4+ My 7-14

Sewage disposal system for suburban home. E: D. Rich. diag Metal Work 84:644-6 N 19

Theory and practice in sewage disposal; septic tank design and construction. D. W. Bingham. diag Metal Work 83:345-6+ Mr 5

Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:313-15, 338-40 S 11-18 '15

Serbia. See Servia

Serum therapy

Garden of serpents in the Serotherapic insti-tute of Brazil. J. Boyer. il Sci Am 112:447 tute of Brazil. J. Boyer. il Sci Am 112:447 My 15 '15 New method of disinfecting wounds. Sci Am S 80:111 Ag 14 '15

resent geographical position of J. Cvijic. Sci Am 112:219 Mr 6 '15 Present Serbia.

Settlers, Slag. See Slag settlers

Settling ponds

Settling-pond sludge box. il Eng & Min J 98: 1139 D 26 '14

Sewage

Establishing and enforcing a British standard for sewage effluents. Eng N 72:1325 D 31 '14 Sewer construction in Chicago, Ill., with a ladder type excavator. S. E. Bates. Il Munic Eng 49:193-5 N '15 Waste greases from sewage. Metal Work 84: 236 Ag 20 '15

Sewage dis-Ree also Sewage aeration; Sewage posal; Sewage flow; Sewage pumping; age sampling; Sewage sludge; Sewage Sewer pipes; Sewerage; Water pollut dis-Sewage tanks; Water pollution

# Testina

Analytical methods for the control of sewage-treatment works. Eng N 73:64-5 Ja 14 '15 Brooklyn sewage-aeration and activated-sludge experiments. E. J. Fort. il diag Eng N 74:214-17 Jl 29 '15 Comparison of methods for determining putrescibility or oxygen demand. F. E. Hale and T: W. Melia. J Ind & Eng Chem 7:760-4

S '15
Decatur, Ill. installs plant for sewage tests. il Eng Rec 71:495-6 Ap 17 '15
Determination of the biochemical oxygen demand by the saltpeter method in stockyards, tannery and corn products wastes. A. Lederer. J Ind & Eng Chem 7:514-16 Je '15
Electrolytic sewage treatment, Elmburst, Borough of Queens, New York city. Munic J 39:551-4 O 7 '15

Electrolytic sewage treatment plant at Durant Electrolytic sewage treatment plant at Durant, Oklahoma. W. L. Benham. il diags Munic Eng 49:141-6 O '15 Operation of sewage disposal plants. F. E. Daniels. Munic J 37:553, 735-8, 879-80 O 15, N 19, D 17 '14 Recommended tests for use in laboratory control of sewage works operation. Eng & Contr 43: 3-4 Ja 6 '15

Sewage works operation: report of a committee of the American public health association. Munic J 37:882-3 D 17'14

Tests controlling sewage plant operation. Eng Rec 70:674-5 D 19 '14

Sewage aeration

Activated sludge and the Baltimore sewage experiments, G. J. Requardt, diag Eng Rec 72:23 Jl 3 '15

Activated sludge and the Baltimore sewage experiments. O. J. Wilkinson, Eng Rec 72: 640 N 20 '15

Sewage aeration - Continued

Activated sludge and the Baltimore sewage experiments. W. S. Coulter, diag Eng Rec 71: 784 Je 19 '15

Activated-sludge experiments at Milwaukee, Wis. T. C. Hatton, diags Eng N 74:134-7 Jl

15 '15 Activated-sludge experiments at Urbana, Ill. Eng N 74:1096-7 D 2 '15 Activated sludge experiments in Canada. R. O. Wynne-Roberts. Munic Eng 49:68-9 Ag '15 Activated sludge experiments in Canada, R. O. Wynne-Roberts, Munic Eng 49:68-9 Ag '15 Activated sludge in America: an editorial survey, M. N. Baker, il diag Eng N 74:164-71 Jl 22 '15; Abstract, Eng M 49:931-3 S '15 Activated sludge sewage disposal, il Munic J 38:504-5 Ap 15 '15 British engineer submits an activated-sludge query. O. J. Wilkinson, Eng N 74:948 N 11 '15

Brooklyn sewage-aeration and activated-sludge

Prooklyn sewage-aeration and activated-sludge experiments. E. J. Fort. il diag Eng N 74: 211-17. Jl 29 '15.

Choosing air compressors for activated-sludge tanks. C. H. Nordell. Eng N 74:904-6 N 4 '15.

Co-operation sought in conducting activated sludge experiments at Baltimore. L. C. Frank and C. W. Hendrick. diag Eng Rec 71:521-2 Ap 24 '15.

English experiments on sewage aeration reviewed as preliminary to Baltimore tests. L. C. Frank. Eng Rec 71:288-9 Mr 6 '15.

Purification of sewage by aeration in the presence of activated sludge. E: Bartow and F. W. Mohlman. J Ind & Eng Chem 7:318-20 Ap '15; Same. il Eng & Contr 43:310-11. Ap 7 '15; Same. Eng N 73:647-8 Ap 1 '15; Same. Eng Rec 71:421-2 Ap 3 '15.

Sewage aeration at Lawrence and Manchester compared. H. W. Clark. Eng Rec 71:367-8 Mr 20 '15.

Mr 20 '15
Treatment of sewage by aeration in the presence of activated sludge. E: Bartow, il Met & Chem Eng 13:901-4 D 1 '15
World's first full-scale plant for the treatment of sewage by the activated sludge process, Milwaukee, Wis. T. C. Hatton. diags plan Eng & Contr 44:322-7 O 27 '15; Same cond. Eng Rec 72:481-4 O 16 '15; Abstract. Munic J 39:776-7 N 18 '15

Sewage disposal

Same cond. Eng Rec 72:481-4 O 16 '15; Abstract. Munic J 39:776-7 N 18 '15

Sewage disposal
Additions to the Baltimore sewage-works. il diag Eng N 74:278-9 Ag 5 '15
Advances in sewage disposal. G: W. Fuller, Eng Rec 71:10-11 Ja 2 '15
Akron is building sewage and garbage disposal plants. plan Eng Rec 71:63 Ja 9 '15
Albany sewage-disposal works. J: H. Gregory, plans Eng N 74:692-5 O 7 '15
Albany's sewage treatment plant; sixteen Imhoff tanks and eight sludge beds. il diags Munic J 38:837-40 Je 17 '15
Chicago should no longer depend on sewage dilution. Eng Rec 72:394 S 25 '15
Collection and disposal of sewage at seaside resorts. M. A. Pugh. il diags Eng & Contr 43:175-9 F 24 '15
Collection and treatment of sewage in Philadelphia. Eng & Contr 42:205-7 Ag 26 '14
Collection and treatment of sewage in their relation to the city of Philadelphia. G: S. Webster. Boston Soc C E J 1:277-89 My '14
Committee outlines best methods for sewage works operation. Eng Rec 72:316-17 S 11 '15
Construction and operation of Gloversville sewage works. H. P. Eddy and H. J. Hanmer, il diags plan Eng N 74:744-7, 780-1 O 14-21 '15
Converting old septic tank and contact beds into two-story tank and sprinkling filters at Moorestown, N. J. A. Potter, il plans Eng & Contr 42:473-6 N 18 '14
Data and discussion on the handling of sewage sludge. Eng & Contr 43:45- Ja 6 '15
Degree of purification desirable and practicable in sewage treatment plants in Iowa. L. Higgins. Eng & Contr 43:45- Ja 6 '15
Design, cost and operation of new sewage treatment plant at the state hospital, Warren, Pa. P. E. Mebus and F. R. Berlin, plans Eng & Contr 43:265-8 Mr 24 '15
Design of sewage systems for residences, D. W. Bingham. Metal Work \$2:730 D 4 '14
Design of fewage systems for residences, D. W. Bingham. Metal Work \$2:730 D 4 '14
Design of fewage systems for residences, D. W. Bingham. Metal Work \$2:730 D 4 '14

Disposal of Greater New York's sewage; general plans. C: E. Gregory. Munic J 39: 692-4 N 4 '15

Experience in Germany with combined sedimentation and digestion tanks and separate sludge digestion tanks. K. Thumm and E. C. Reichle. Eng & Contr 42:339-42 O 7 '14; Same cond. (Preliminary report on Emscher tanks and kindred sewage-clarification processes). Eng N 72:1306-8 D 31 '14

Future sanitary problem of Chicago; symposium. W Soc E J 19:757-75 O '14

Handling of sewage sludge; abstracts. G: S. Webster. Am Soc M E J 37:95-7 F '15; Munic J 38:222-4 F 18 '15; Discussion. Am Soc M E J 37:97-8 F '15

Inhoff tanks and sprinklers for sewage of Brighton district, Rochester, New York. diags plan Eng Rec 71:679-82 My 29 '15

Inoffensive sewage disposal. R. Hering. plan diags Munic Eng 48:127-9 F '15

Low river flow exacting for Columbus sewage works. Eng Rec 71:492 Ap 17 '15

Main drainage works proposed for New York. G: A. Soper. il maps Boston Soc C E J 1:31-66 F '14

Maintenance of sewers and disposal works demands treatment of injurious trade wastes. W. L. Stevenson. Eng Rec 71:256-60 F 27 '15
Making over a small sewage-treatment plant at Morristown, N. J. il diag Eng N 73:208-9

F 4 '15

Marysville, Ohio, sewage-treatment plant; screening, two-story sedimentation tanks, crushed-stone contact beds and intermittent sand filters. E. D. Barstow. Eng Rec 72:636-7 N 20 '15

Ninth and final reports of the Royal commission on sewage disposal of Great Britain. Eng & Contr 43:478-9 My 26 '15

Observations of some European water purification and sewage disposal plants. E: Bartow. il Am Water Works Assn J 2:13-24 Mr '15

Operating records of Atlanta sewage treatment plant show adequate degree of purification. C: C. Hommon. il Eng Rec 72:4-7 Jl 3 '15

Operating sewage disposal plants. Munic J 38: 66 Ja 21 '15

Operation of sewage disposal plants. F. E.

66 Ja 21 '15 Operation of sewage disposal plants. F. E. Daniels. il Munic J 36:67-71, 237-40, 389-92, 529-33, 733-6, 885-8; 37:67-9, 225-8, 386-8, 552-3, 735-8, 879-82 Ja 15, F 19, Mr 19, Ap 16, My 21, Je 18, Jl 16, Ag 20, S 17, O 15, N 19, D 17 '14

D 17 '14
Operation of the Plainfield sewage-works.
J: R. Downes. Eng N 73:234-5 F 4 '15
Ornamental plants on sewage bed. Harrison,
N. Y. A. Potter, il Eng N 74:412 Ag 26 '15
Philadelphia sewage report. Eng N 73:1051-2

Philadelphia's sewage disposal problem. W. L. Stevenson. il Metal Work 83:728-9 My 21

'15
Placing a neglected sewage treatment plant in successful operation at Monticello, Arkansas. G. A. Watkins. il plan Eng & Contr 43: 247-8 Mr 17 '15
Plumbing installation and sewage disposal. C: A. Whittemore. Brickb 24:115-18, 137-40, 171-3 My-JI '15
Probable future of various sewage treatment methods. G: W. Fuller. Eng & Contr 42:204-5 Ag 26 '14
Processes available for the treatment of industrial wastes. Eng & Contr 43:363-5 Ap 21 '15

All 15 Recommend filtering Chicago water and progressive disposal of sewage. G: A. Soper, J: D. Watson and A. J. Martin. Eng Rec 71:709 Je 5 '15 Recommended general procedure in sewage works operation. plan Eng & Contr 42:567-8 D 16 '14

Reject untried sewage treatment methods for Decatur, Ill. L. Pearse and S. A. Greeley. Eng Rec 71:775-6 Je 19 '15

Remodeling of septic tanks into Imhoff tanks eliminates odors from land irrigation, il diags plan Eng Rec 71:747-8 Je 12 '15

Royal commission on sewage disposal. Engineer 119:378-9 Ap 16 '15

Sanitary engineering in 1914. Engineer 119:31-2, 55-6 Ja 8-15 '15

Sewage disposal-Continued

Schenectady's sewage disposal plant; nine shallow Imhoff tanks and three acres of sprinkling filters. il plans Munic J 38:499-504

Ap 15 '15 Sewage disposal at Baltimore water purifica-

Sewage disposal at Baltimore water purification plant. J. W. Armstrong. il diag plan Munic J 39:251-2 Ag 19 '15
Sewage disposal at Bloomington; abstract. U. S. Hanna. Munic J 37:883-4 D 17 '14
Sewage disposal at Lethbridge, Alberta. A. C. D. Blanchard. Munic Eng 48:217-20

Mr '15 Sewage disposal by septic tank systems. W. H. Chapman. diags Dom Eng 71:94-6 Ap 24 '15 Sewage disposal in Chilliwack, B. C. D. P. Dunn. diags Munic J 38:687-9 My 20 '15 Sewage disposal in Maryland; advantages of joint sewerage and sewage treatment sys-tems for small towns. Munic J 38:842-4 Je 17

Sewage disposal plant at Aberdeen, South Dakota; with discussion. W. G. Potter, il plans W Soc E J 19:7-88-805, pl 1-8 O '14; Same. Eng & Contr 43:37-8 Ja 13 '15; Same cond. Metal Work 84:214-17 Ag 13 '15; Same disposal plant for Akron. il diags plan Munic J 39:71-4, 112-14 Jl 15-22 '15 Sewage disposal system for private house. G. E. Watkins, diags Metal Work 83:381-2 Sewage disposal with several series of the series o

Mr 12 '15
Sewage disposal without odor. R. Hering.
Munic Eng 48:181-5 Mr '15
Sewage disposal works at Fitchburg, Mass.
D: A. Hartwell. ii fold maps Boston Soc.
C E J 2:203-22 Je '15; Excerpt (Costs of the Fitchburg sewage treatment works) Eng & Contr 43:566 Je 23 '15
Sewage disposal works at Leeds. maps Engineer 118:501-2 N 27 '14
Sewage purifying plant at Ostend. Sci Am 112: 50 Ja 9 '15
Sewage-treatment and garbage-reduction

Sewage-treatment and garbage-reduction works for Akron, Ohio. Eng N 73:147 Ja 28

Sewage-treatment plant at Calvert, Tex. T: L. Fountain, il diags plan Eng N 73:930-4 My

ewage treatment plant for a small sanatorium. R. F. MacDowell. il diags Eng N 73: 1014-16 My 27 '15 Sewage

1014-16 My 27 '15 Sewage treatment: report of committee of American public health association. il Munic J 38:7-10 Ja 7 '15 Sewage-works of Marysville, Ohio. diags Eng N 73:484 Mr 11 '15 Sewage-works operation. Eng N 73:110 Ja 21

Sewage works operation. Munic J 39:434 S 16

Small sewage treatment plant: Home for the indigent of Delaware county, Pa. P. E. Mebus and F. R. Berlin. il diag plan Munic J 37:877-9 D 17 '14

Steam disinfection for sewage on common carriers, diag Eng Rec 71:43 Ja 9 '15; Same (Sewage treatment on trains and boats). Eng M 48:917-18 Mr '15

Suggestions on the operation of small sewage treatment plants. Eng & Contr 43:82-3 Ja 27 '15

Theory and practice in sewage disposal; septic tank design and construction. D. W. Bingham. diag Metal Work 83:345-6+ Mr 5

Three districts for disposal of Cleveland's sewage, R. W. Pratt. Eng Rec 71;422 Ap 3 sewage. R.

Two years' tests indicate best treatment for Chicago stock yards wastes, il Eng Rec 71:266-8 F 27 '15

West End sewage-treatment works, Hamilton, Ont. B. E. T. Ellis, diags plans Eng N 73:424-8 Mr 4 '15

World's first full-scale plant for the treatment of sewage by the activated sludge process, Milwaukee, Wis. T. C. Hatton, diags plan Eng & Contr 44:322-7 O 27 '15; Same cond. Eng Rec 72:481-4 O 16 '15; Abstract. Munic J 39:776-7 N 18 '15

See also Imboff tanks; Plumbing; Refuse and refuse disposal; Septic tanks; Sewage—Testing; Sewage aeration; Sewage irrigation; Sewage pumping; Sewage tanks; Sewerage; Water pollution; Water purification

#### Disinfection

Automatic device controls hypochlorite appli-cation. E. E. Ludwick, diags Eng Rec 72: 103-4 Jl 24 '15

# Electrolytic treatment

Electrolytic method of sewage disposal. J. C. Olsen, il Met & Chem Eng 13:735-9, 793-7 O 15-N 1 '15

Electrolytic sewage treatment, Elmhurst, Borough of Queens, New York city. Munic J 39:551-4 O 7 '15 Electrolytic sewage treatment plant at Dur-ant, Oklahoma. W. L. Benham. il diags Mu-nic Eng 49:141-6 O '15

# Experiments

Activated-sludge experiments at Urbana, Ill. Eng N 74:1096-7 D 2 '15

Activated-sludge experiments at Urbana, III. Eng N 74:1096-7 D 2 '15 Activated sludge in America: an editorial survey. M. N. Baker. il diag Eng N 74:164-71 Jl 22 '15; Abstract. Eng M 49:331-3 S '15 Activated sludge sewage disposal. il Munic J 38:504-5 Ap 15 '15 Co-operation sought in conducting activated sludge experiments at Baltimore. L. C. Frank and C. W. Hendrick. diag Eng Rec 71:521-2 Ap 24 '15 Design of the sewage treatment experimental plant at Brooklyn. N. Y. G: T. Hammond. Eng & Contr 42:527-30 D 2 '14; Same cond. Munic Eng 47:427-36 D 1'44 English experiments on sewage, aeration reviewed as preliminary to Baltimore tests. L. C. Frank. Eng Rec 71:288-9 Mr 6 '15 Milwaukee sewerage problem and the sewage treatment testing station. T. C. Hatton. Eng & Contr 42:368-9 O 14 '14 Purification of sewage by aeration in the presence of activated sludge. E: Bartow and F. W. Mohlman. J Ind & Eng Chem 7:318-20 Ap '15; Same. Eng N 73:647-8 Ap 1 '15; Same. Eng N 73:647-8 Ap 1 '15; Same. Eng Ro 71:421-2 Ap 3 '15 Sewage aeration at Lawrence and Manchester compared. H. W. Clark. Eng Rec 71:367-8 Mr 20 '15

Treatment of sewage by aeration in the presence of activated sludge. E: Bartow. il Met & Chem Eng 13:901-4 D 1'15

#### Filtration

Algae growths cover Atlanta sewage filters.
C: C. Hommon. il Eng Rec 72:335 S 11 '15
Concrete blocks cover sewage filter underdrains. il Eng Rec 71:333 Mr 13 '15
Constructing the Fitchburg sewage-works.
F. A. Marston. il diags Eng N 74:4-6 Jl 1 '15

Design feature of new sewerage system and sewage disposal works for Cleburne. Texas. R. E. McDonnell. diags plans Eng & Contr 44:72-5 Jl 28 '15 Economics of sewage filters. G: W. Fuller. Eng & Contr 42:369-71 O 14 '14 Economy of deep sewage filters explained on basis of "held" water and hydraulics. H. W. Clark. Eng Rec 72:477-8 O 16 '15 Method of adjusting sewage sprinklers. A. T. Nabstedt. diag Eng N 74:219-20 Jl 29 '15 Sewage-works of Morristown, N. J. C. Potts. il diags plan Eng N 73:1105-8 Je 10 '15 Typical Iowa sewage treatment plant and its proper operation. Eng & Contr 44:6-7 Jl 7 '15

Variable-capacity hotel sewage-treatment plant. G: L. Robinson, il plan Eng N 74:346-7 Ag 19 '15

# Regulation

State control of sewage-treatment works. Eng N 74:591-2 S 23 '15

#### Screening

Adoption of fine screening at Daytona, Fla. Eng & Contr 43:5-6 Ja 6 '15 Clarifying sewage by fine screens. K. Allen. il diags Munic J 39:143-5, 186-8, 220-2 Jl 29-

il diags Munic J 39:143-5, 186-8, 220-2 Jl 29-Ag 12 '15 ine screening adopted in preference to sedimentation and separate sludge digestion, on cost basis, at Brooklyn. diag Eng & Contr 44:7 Jl 7 '15

Riensch-Wurl sewage screens, Brooklyn. il Eng N 73:1224-5 Je 24 '15

Sewage disposal—Screening—Continued
Sewage pumping, screening and sterilizing
station at Daytona, Fla.; specifications.
plans Eng & Contr 42:525-7 D 2 '14
Sewage screening at Daytona, Fla. Munic J

37:884 D 17 '14

Sewage treatment in Germany by means of the Riensch-Wurl rotating screen, Endris, il Eng & Contr 42:273-6 S 16 '14

Sewage disposal, Rural City sewers for country homes, plan Dom Eng 72:351 S 18 '15

Eng 72:351 S 18 '15

Sewage disposal for country homes, diags plans

Bldg Age 37:63-5 S; 65-7 O '15

Sewage disposal in rural country districts.

B. D. Colby, Metal Work 84:341-3 S 10 '15

Sewage disposal methods in country places,

T. Horton, diags Metal Work 84:679-81 N 26
'15

Sewage disposal methods in rural districts. diags Metal Work 83:672-5, 693-4+ My 7-14

Sevent Se

hree residential sewage-treatment plants near Cleveland, R. F. MacDowell, Eng N 74: 56-7 Jl 8 '15; Abstract, Concrete Cem 7:81 Ag '15 Three

Ag '15 Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:313-15, 338-40 S 11-18 '15

Sewage ejectors

ewage ejectors
Beggs electrically controlled automatic sewage
ejector system. plan Eng & Contr 43:524 Je
9 '15; Eng Rec 71:699 My 29 '15; Power 42:
43 Jl 13 '15
Efficiency test of a Shone ejector plant. C. S.
Moore. diag Eng & Contr 43:564-5 Je 23 '15;
Same. Munic J 39:76-8 Jl 15 '15

Sewage farms. See Sewage irrigation

Sewage flow

ewage flow
Automatic sewage-pumping and metering station, Providence, R. I. A. A. Wood, il plans Eng N 74:293-4 Ag 12 '15
Devices for measuring the flow of sewage. E: Wright, jr., and others, il diags Boston Soc ('E'J 1:435-4 O'14; Same. Eng & Centr 43:508-11 Je 9'15
Dye for measuring sewage flow, F. E. Daniels. Munic J 39:550-1 O 7'15
Method and results of making sewage gagings at Berkeley, Calif. T. A. Bither, plan Eng & Contr 43:556-6 Je 23'15
Run-off from sewered areas; final report of committee, bibliog il diags Boston Soc C E J 1:291-382 Je '14; Abstract. Munic J 37:73-4
Jl 16'11
Sewage measurement and automatic control

Ji 16 11 Sewage measurement and automatic control of storm overflow at Pawtucket, R. I. G. A. Carpenter, il diags Boston Soc C E J 1:419-

Carpenter, il diags Boston Soc C E J 1:419-27 O '14
Sewer gaging at Seattle in the light of St. Louis gagings. W: W. Horner; H: D. Silliman. Eng N 74:1091-3 D 2 '15
Sewer gagings and maximum flow in a Seattle outfall. H; D. Silliman. map Eng N 74: 832-4 O 28 '15
Simple and efficient recording gage for weir measurements. D: E. Adams and E. I. Roberts. il diags Eng N 73:1135-6 Je 10 '15
Simple and efficient recording gage for weir measurements. il diags Eng N 73:1329-31 Ap 29 '15

Venturi meter for sewage measurement, C: G. Richardson, il diags Boston Soc C E J 1:429-37 O '14

Sewage irrigation

How the city of Nottingham, England, solved its sewage disposal problem. C. M. Hitch. Dom Eng 72:377-8 S 25 '15; Same. Metal Work 84:399 S 24 '15

Sewage disposal at a profit in Nottingham, England. Sci Am 113:442 N 20 '15

Sewage pumping

Automatic sewage-pumping and metering station, Providence, R. I. A. A. Wood, il plans Eng N 74:293-4 Ag 12 '15

Baltimore sewage-pumping plant. W. O. Rogers. il Power 41:76-8 Ja 19 '15

Boston's new sewage pumping station. W. B. Conant. il Munic J 39:775-6 N 18 '15

Constructing Passaic valley pumping station. il plan Munic J 38:341-4 Mr 18 '15
Constructing pumping station in unbraced cofferdam formed by outside walls. il plans Fing Rev 71:292-4 Mr 6 '15
Fairview sewage-pumping station. T: Wilson. il plan Power 41:286-7 Mr 2 '15
First section of Sacramento trunk sewer completed. Eng Rev 71:461 Ap 10 '15
Sewage collection and pumping systems on low-lying Park Point near Duluth, Minn. diags Eng & Contr 43:309-10 Ap 7 '15
Sewage pumping plants; brief descriptions of plants operating in seventy-five cities, Munic J 38:358-62 Mr 18 '15
See also Sewage ejectors

See also Sewage ejectors

Sewage purification. See Sewage disposal

Sewage sampling
Obtaining samples of sewage and sewagic
liquids for testing. G. B. Kershaw. Eng &
Contr 42:342-4 O 7 '14

Sampling at experimental sewage treatment plant at Chicago stockyards. Eng & Contr 43:83 Ja 27 '15

Sewage sludge

ewage sludge
Can sewage sludge be made valuable as a
fertilizer? Eng N 73:593 Mr 25 '15
Co-operation sought in conducting activated
sludge experiments at Baltimore. L. C.
Frank and C. W. Hendrick. diag Eng Rec
71:521-2 Ap 24 '15
Data and discussion on the handling of sewage sludge. Eng & Contr 43:4-5 Ja 6 '15
Drying of sludge and its further use: abstract.
H. Hermanns. diag Am Soc M E J 37:51-2
Ja '15
Experience in Germany with combined

Ja '15

Experience in Germany with combined sedimentation and digestion tanks and separate sludge digestion tanks. K. Thumm and E. C. Reichle. Eng & Contr 42:339-42 O 7 '14; Same cond. (Preliminary report on Emscher tanks and kindred sewage-ciarification processes). Eng N 72:1306-8 D 31 '14

Handling of sewage sludge; abstracts. G: S. Webster. Am Soc M E J 37:95-7 F '15; Munic J 33:222-4 F 18 '15; Discussion. Am Soc M E J 37:97-8 F '15

Measuring the drainability of Emscher tank sludge. W. L. Stevenson. il Eng & Contr 44: 212 S 15 '15; Same. Munic J 89:427-8 S 16 '15; Same cond. Eng N 74:566 S 16 '15

Saving the grease in sewage. Sci Am 113:205

Sewage disposal without color.

S 4 '15 Sewage disposal without odor, R. Hering, Munic Eng 48:181-5 Mr '15 Treatment of sewage by aeration in the pres-ence of activated sludge, E; Bartow, il Met & Chem Eng 13:901-4 D 1 '15

See also Sewage aeration; Sewage disposal

Sewage tanks

Sewage-intercepting chamber and settling tank for the Illinois state training school for girls, at Geneva, Ill. diags Eng N 72:1202-3 D 17

Variable-capacity hotel sewage-treatment plant. G: L. Robinson. il plan Eng N 74:346-7 Ag 19 '15

Sec also Emscher tanks; Imhoff tanks; Septic tanks

Sewage testing. See Sewage-Testing

Sewer air

Investigation of sewer air following Boston explosion. H. W. Clark, Eng Rec 70:606-7 D 5 '14

Sewer cleaning

few sewer-cleaning machine. il Eng N 73: 591-2 Mr 25 '15

Preventing and removing dirt in sewers. Munic J 38:68 Ja 21 '15

Sewers cleaned with scrapers to pass ball test. C. A. Bryan. il Eng Rec 70:698-9 D 26-14

Water power sewer cleaning device. il Eng & Contr 44:152 Ag 25 '15

Sewer design

Circular sewers versus egg-shaped, catenary and horseshoe cross-sections. R. D. French, Eng Rec 72:222-3 Ag 21 '15

Comparing sewer sections. B: Brooks; R. S. Beard. 29 diags Eng Rec 72:608-10 N 13 '15.

Sewer design -Continued

ewer design—Continued

Design features of new sewerage works at Edmonton, Alberta. diags plans Eng & Contr 43:400-1 My 5 '15

Design of regulators and storm water overflows for sewers for Cincinnati, E. J. Miner, diags Eng & Contr 42:156-7 Ag 12 '14

Design of the sewerage system for the Panama-Pacific international exposition. W: C. Willard, diags plan Eng & Contr 42:434-40 N 4 '14

Graphic method of determining runoff in storm sewers; discussion. Eng N 72:1322-5 D 31 '14 Graphic method of determining runoff to sewers. C. H. Nordell; O. Hufeland. Eng N 73:693-4 Ap 8 '15

13:1933-4 Ap 8 15 New sewer inlets at St. Louis. S. Chivvis. il diags Eng N 74:652-3 S 30 '15 Storm water inlets; information concerning dimensions and construction of inlet open-ings, inlets and catch basins in several hundred cities, diags Munic J 38:690-4 My 20

dred cities. diags Munic J 38:690-4 My 20 10 Sewer explosions
Apparatus for testing sewer atmosphere for explosive gases. H: J. Kellogg. diag Eng & Contr 42:273 S 16 '14
Following explosion, Boston sewer tests show no gasoline. Eng Rec 71:457-8 Ap 10 '15 Inflammable wastes in sewers. N. S. Sprague. diags Munic Eng 47:336-43 N '14; Same. Eng & Contr 42:476-8 N 18 '14; Excerpt. Eng Rec 70:442-3 O 17 '14
Quantity of gasoline necessary to produce explosive mixtures in sewers. G. A. Burrell and H. T. Boyd, diags J Ind & Eng Chem 7:750-4 S '15; Abstract. Eng N 74:955 N 11 '15

Sewer explosion at East Boston pumping station, Munic Eng 48:45-6 Ja '15 Valid reactions for plumbing ordinances and plumbing inspection. T: J. Claffy. Dom Eng

Sewer gas

Sewer gas and its relation to public health: further discussion. A. R. McGonegal; A. Bateman. Metal Work 82:831-2 D 25 '14 Valid reasons for plumbing ordinances and plumbing inspection. T: J. Claffy. Dom Eng 73:235-7 N 20 '15

Sewer pipes

lewer pipes
Cast iron pipe vs. vitrified stone-ware pipe
for house sewers. W; R. Marshall. il Dom
Eng 71:310 Je 12 '15
Constructing an outfall sewer at Canton, Ohio.
il Eng N 74:264-5 Ag 5 '15
Load tests of concrete pipe in Savannah, E. R.
Conant. il Eng N 74:556-7 S 16 '15
Manufacture of concrete sewer pipe. il Metal
Work 82:833-4 D 25 '14
Manufacturing and laying reinforced concrete
sewer pipe at Philadelphia. il Eng & Contr
43:245-7 Mr 17 '15
'Tests of circular and egg-shaped reinforced
concrete sewer pipe. A. T. Goldbeck, il diags
Eng & Contr 43:307-9 Ap 7 '15; Same (Reinforced-concrete sewer pipe tested for stiffness and impermeability) Eng Rec 71:711-12
Je 5 '15; Same, with table. Concrete Cem
6:232-5 My '15

ewerage
Adapted machinery and construction methods
employed on new Western avenue sewer,
Chicago—time studies. S. E. Bates. il diag
Eng & Contr 44:283-5 O 13 '15
Albany's sewage treatment plant; sixteen Imhoff tanks and eight sludge beds. il diags
Munic J 33:837-40 Je 17 '15

Beargrass Creek storm-water channel at Louisville, Ky. J. H. Kimball, il diag plan Eng N 72:1256-60 D 24 '14

Beat scheduled time five months in building huge De la Brea sewer, Los Angeles. il Eng Rec 72:130-2 Jl 31 '15

Collapsible form for sewers. diags Eng N 73:494

Collection and disposal of sewage at seaside resorts, M. A. Pugh, il diags Eng & Contr 43:175-9 F 24 '15

Collection and treatment of sewage in Philadelphia. Eng & Contr 42:205-7 Ag 26 '14

Construction of a 6-ft. segmental-block sewer. B: Wilk, il Eng N 73:838-9 Ap 29 '15

Construction of the Metcalf ave. sewer, borough of the Bronx, New York city. G. L. Christian. il diags Eng N 72:1164-7 D 10 '14 Contract plans for sewer work at Columbus, Ohio. Eng N 74:1034-5 N 25 '15

Design and construction of the Market street flood channel, Burlington, Ia. C. T. Bowen. Eng & Contr 43:129-30 F 10 '15

Design, construction and cost of new sanitary sewer system at Carrollton, Ill. M. C. Poulsen. il Eng & Contr 43:507-8 Je 9 '15

Design, construction and cost of new sanitary sewerage system at Alton. Ill. J. E. Schwaab. Eng & Contr 43:127-8 F 10 '15

Design, construction and operation of Lethbridge, Alberta, sewage treatment works. plan Eng & Contr 43:401-3 My 5 '15

Diagram for computing rock in sewer trenches. C. A. Bryan. Eng N 73:1081-2 Je 3 '15

Excavating and backfilling sewer trenches by machine. Eng Rec 71:20-1 Ja 2 '15

Fall River mills will benefit by \$3,000,000 water and sewerage project. diag Eng Rec

water and sewerage project, diag Eng Rec 72:501-3 O 23 '15
Making over a storm sewer at Lincoln, Neb. G: W. Bates. il diag Eng N 73:710-11 Ap 15

Method and cost of constructing an inverted sewer siphon of 12 in. cast iron pipe, en-cased in concrete, beneath small stream at Carlisle, Pa. C. A. Bryan. diag Eng & Contr 42:151-3 Ag 12 '14

Carlisle, Pa. C. A. Bryan. diag Eng & Contr 42:151-3 Ag 12 '14

Method and cost of making a relocation survey of underground pipe lines. O. E. Carr. plans Eng & Contr 42:153-5 Ag 12 '14; Same cond. (Underground survey of Cincinnati). Eng Rec 71:38-40 Ja 9 '15

Method and cost of making house connections to the New Orleans sewerage system. Eng & Contr 42:203-4 Ag 26 '14

Milwaukee sewerage problem and the sewage treatment testing station. T. C. Hatton. Eng & Contr 42:367-9 O 14 '14

New sewerage system of Cairo, Egypt. diags Eng N 74:545 S 16 '15

New water-conservation scheme at Fall River, Mass. diag Eng N 74:760-1 O 14 '15

90-in. circular gate for a 120-ft. head. il diags Eng N 73:865 My 6 '15

Philadelphia sewage treatment report. Munic J 38:840-2 Je 17 '15

Philadelphia's sewerage report; editorial comment. Munic J 39:257-9 Ag 19 '15

Proposed method of enclosing a stream in reinforced concrete conduit through Mansfield, Ohio. C. L. Bushey. diag Eng & Contr 43:128-7 F 10 '15

Recommended procedure in disposal of wastes from the stockyards and Packingtown in Chicago. Eng & Contr 43:38-9 Ja 13 '15

Reinforced-concrete sewer viaduct. E. D. Gilman. il diag Eng N 73:3191 Je 17 '15

San Francisco's sewerage system. A. J. Cleary. il diags maps Eng N 73:305-10 F 18 '15

San Francisco's sewerage system. A. J. Cleary. il diags maps Eng N 73:305-10 F 18 '15

Scope of engineering reports and plans for sewerage and sewage disposal works in Sas-katchewan. Eng & Contr 42:155-6 Ag 12 '14

7000-foot pipe line floated to place in Lake Ontario in long sections. N. A. Brown. il diags Eng Rec 72:20-1 Jl 3 '15

Sewage collection and pumping systems on low-lying Park Point near Duluth, Minn. diags Eng & Contr 43:309-10 Ap 7'15

B. 15 Sewage disposal in Chilliwack, B Dunn. Munic J 38:687-9 My 20

Sewer connections common trouble source. Metal Work 83:874 Je 18 '15

Sewer construction at Ludington. G: W. Clark. il Munic J 38:62-4 Ja 21 '15

Sewer construction, 1915; tabulation. Munic Eng 48:264-5 Ap '15

Sewer street at Wichita, B. C. Wells. Munic J  $38:357~\mathrm{Mr}$  18~'15Sewer tunnel construction in Alton, Ill. J. E. Schwaab. Munic Eng 48:43-4 Ja '15

Sewerage in Salt Lake. il Munic J 38:347-8 Mr 18 '15

Sheeting and pumping methods for Chicago sewer trench. il Eng Rec 71:245 F 20 '15 Street flooding prevented by wide storm-sewer intakes. il Eng Rec 72:663 N 27 '15

Sewerage -Continued

Taking care of drainage at street intersections. C. V. Mann. il plan Eng N 74:221 Jl 29 '15 Water supply and drainage in Argentina. A. Dale. il Metal Work 84:103-6 Jl 23 '15

See also Drain tile; Drainage, House; Plumbing; Sanitary engineering; Sewage; Sewage disposal; Sewage pumping; Sewer air; Sewer cleaning; Sewer design; Sewer explosions; Sewer gas; Sewer pipes; Sewers, Concrete; Trade waste; also San Francisco—Panama-Pacific international exposition—

Catch basins

Comments on catch basins. Munic J 38:348-9 Mr 18 '15

Mr 18 '15 Direct connected inlet vs. catch basin. A. F. Unckrich, Munic J 38:694 My 20 '15

#### Cost

Cost

Final report on Philadelphia's plan of sewage treatment. Eng Rec 71:638 My 22 '15

Handy method of estimating the cost of constructing pipe sewers. W. G. Kirchoffer. Eng & Contr 44:285-6 O 13 '15

Installing a half-mile sewer system; Gilbert, Minn. A. Cohn. Eng N 74:364-5 Ag 19 '15

Sewer work by day labor at Carlisle, Pa.; methods employed, hours of labor and itemized costs. J: C. Hiteshaw. il Munic J 38: 506-8 Ap 15 '15

Sewerage developments at Philadelphia, Pa. Eng & Contr 43:sup20 My 26 '15

Damages from floods, etc.

Performance of the New Orleans water, sewerage and drainage systems during the recent hurricane. G: G. Earl, Eng & Contr 44:387-9 N 17 '15

#### Design

Sce Sewer design

#### Finance

Privately financed system of sewers for the borough of Troy, Pennsylvania. H: W. Tay-lor. Eng Rec 71:79-80 Ja 16 '15

# Laws and regulations

Features of the Ontario statutes and their administration affecting water supplies and sewerage systems, F. A. Dallyn. Am Water Works Assn J 2:344-50 Je '15 Maintenance of sewers and disposal works demands treatment of injurious trade wastes. W. L. Stevenson. Eng Rec 71:256-60

Sewage disposal in Maryland; advantages of joint sewerage and sewage treatment sys-tems for small towns. Munic J 38:842-4 Je 17 '15

#### Maintenance and repair

Cement gun for relining old brick and ashlar sewers. L. Chivvis. il Eng N 74:939-40 N 11 '15

Reinforcing a vitrified-pipe sewer at Passaic, N. J. S. J. Naughton, Eng N 73:696 Ap 8 '15

Removal of bottle neck augments flow in sewer, il Eng Rec 71:486 Ap 17 '15 Repairing a cracked sewer. L. B. Lawrence, il diag Munic J 38:217-18 F 18 '15 Water and sewer maintenance in New Orleans, il Munic J 39:354-6 S 2 '15

#### Run-off

See Sewer design

#### Statistics

Report of committee on sewerage statistics.

Boston Soc C E J 1:263-76 My '14

Sewerage statistics for 1914. Munic J 38:349+,

510 Mr 18, Ap 15 '15

Sewers, Concrete
Beat scheduled time five months in building
huge De la Brea sewer, Los Angeles. il Eng
Rec 72:130-2 Jl 31 '15

Building a sewer tunnel of special concrete blocks reinforced, A. J. Latornell, diags Eng N 74:127-8 Jl 15 '15

Concrete lining improves sewage-laden creek. J. D. Justin. il Eng Rec 72:101-2 J1 24 '15

Constructing Passaic valley sewer, il plan diag Munic J 38:213-17 F 18 '15
Construction features on the Passaic valley sewer, il diags Munic J 38:59-62 Ja 21 '15
Construction of the Metcalf ave. sewer, borough of the Bronx, New York city. G. L. Christian. il diags Eng N 72:1164-7 D 10 '14
Construction plant and methods employed in building a system of concrete block tunnel sewers at Edmonton, Alberta. diags Eng & Contr 43:361-3 Ap 21 '15
Construction plant and methods employed in the North shore intercepting sewer, sanitary district of Chicago. M. A. Berns. il Eng & Contr 42:568-9 D 16 '14
Design and construction features of reinforced concrete sewer siphons under New York subways. T. L. Wilson. Eng & Contr 43:128-9 F

ways. T. L. Wilson. Eng & Contr 43:128-9 F 10 '15
Design and construction of the Arroyo de la Brea storm sewer system, Los Angeles, Cal. il Eng & Contr 44:5-6 JI 7'15
Effect of sewage and sewage gases on concrete. Concrete Cem 7:31-2 JI '15
Improvement of Pogue's Run, Indianapolis, Indiana, il plans Munic Eng 48:236-9 Ap '15
Indianapolis builds million dollar storm-water drain under railroad yards. il Eng Rec 71: 560-1 My 1'15
Laying 48-in. concrete block sewer. Eng N 74:703-4 O 7'15
Method and cost of constructing 42 and 48-in. concrete sewers at San Antonio, Tex. Eng & Contr 44:253-5 S 29'15
Methods and costs in constructing. 42-in. and 48-in. monolithic concrete sewer. E. W. Robinson, il diags Concrete Cem 7:93-6 S'15
New methods of pneumatic tunneling aid safe and rapid completion of Passaic valley sewer contract. il diags Eng Rec 71:130-3 Ja 30'15
Reinforced-concrete work well handled on Chicago sewer, il Eng Rec 72:612 N 13'15
Sewer form; telescopic type for monolithic construction, il Munic J 39:450-1 S 16'15; Eng & Contr 44:214 S 15'15
ewing cabinets

Sewing cabinets

Working details of a sewing cabinet. R. F. Windoes. diags Bldg Age 37:46-7 Ap '15 Sewing machines

Dumore sewing-machine motor, il Elec R & W Elec'n 67:633 O 2 '15
Electric drive for Wilcox & Gibbs sewing machine, il Elec R & W Elec'n 67:992 N 27 '15; Elec W 66:1220 N 27 '15;

Homilton-Beach sewing-machine motor, il Elec R & W Elec'n 67:773 O 23 '15 How sewing machine parts are molded and cast. H. C. Estep, il Foundry 43:345-51 S

Needle threading device, diags Textile World 50:79-80 O

Seventy years of inventions. il Sci Am 112:511-12 Je 5 '15

Westinghouse factory sewing-machine motor. il Elec R & W Elec'n 67:856 N 6 '15; Elec W 66:1048 N 6 '15 Sex in plants

Altering the sex of date palm seedlings. Sci Am 112:127 F 6 '15 Shade trees. See Trees

Shades and shadows

See also Perspective

Shaft gates
Automatic safety lock and indicator for shaft
gates. diag Eng & Min J 99:1118-19 Je 26
'15

Shaft lining Ferro-concrete shaft linings. M. Gillieaux. diags Colliery 35:609-11 Je '15

Modifications in shaft design influenced by concrete as a lining material. Eng & Contr 43:370 Ap 28 '15

Shaft sinking Bell-wire arrangement in sinking. C. P. ard. diag Eng & Min J 99:323 F 13 '15 Bern-

Cementation process for sinking shafts. Walker. Eng & Min J 100:58-9 Jl 10 '15

City tunnel of the Catskill aqueduct. W. E. Spear, il diags Eng N 73:98-103 Ja 21 '15 Cost of sinking 900-ft, shaft. H. A. Linke, diags Eng & Min J 100:845-7 N 20 '15

Shaft sinking -- Continued

Method and cost of grouting a water bearing fissure and seamy rock in sinking a mine shaft. J. R. Reigart. diags Eng & Contr 44: 353-5 N 3 '15

Methods and cost of shaft sinki Astoria tunnel, New York city, J. Eng & Contr 44:200 S 15 '15 sinking at the

Methods and plant employed in sinking a vertical shaft at the Palms mine, Bessemer, Mich. F. Blackwell, diags Eng & Contr 42: 251-3 S 9 '14

Methods and some costs of mine shaft sinking

Methods and some costs of mine shaft sinking in very tough, hard rock. W: Y. Westervelt. Eng & Contr 43:226-7 Mr 10 '15 Shaft-sinking with jackhammers. L. A. Palmer, diag Eng & Min J 100:598-9 O 9 '15 Shaft timbering and headgear on the Mesabi range, diags Eng & Min J 99:1119 Je 26 '15 Sinking by the drop-shaft method. C: Pilkington and P. L. Wood, diags Colliery 35:303-8 Ja '15 pow "C", shaft at the Fast Norrie

Ja '15
Sinking new "C" shaft at the East Norrie mine, Ironwood, Mich, B. G. Best, plan Eng & Min J 100:437-8 S 11 '15
Sinking shoe for soft ground, diags Eng & Min J 100:104-5 Jl 17 '15
Unexcavated core is left in cenfer in sinking circular subway shaft, il diags Eng Rec 71: 522-3 Ap 24 '15
Unique method of sinking shafts in soft ground, L. T. Emory, il Eng N 73:397-8 F 25 '15; Same cond, Eng & Min J 99:945-6 My 29 '15

Sec also, Drilling and boring (earth and

See also Drilling and boring (earth and rocks); Mining engineering

Shafthouses
Shaft-rockhouse practice in the copper country.
L. H. Goodwin, il diags Eng & Min J 99:
1061-6, 1107-10 Je 19-26 '15

Shafting gle of torsion. B. D. Pinkney, diags Mach 2:58 S '15

Angle of torsion. W. B. Gilbert. diag Mach 21: 831 Je '15

See also Belting

831 Je '15 Charts for determining sizes of transmission shafts. J. Y. Dahlstrand. Mach 22:129-30 O

Friction load of shaft bearings. Elec W 66: 809-11 O 9 '15 809-11 0 9

Guarding of shafting, il Ry R 56:220-1 F 13 '15 Preventing losses in factory power plants, S. J. H. White, Iron Age 95:848-9 Ap 15 '15

Shafts

hafts
Centering shafts. C. E. Hendricks, diag Mach 21:1014 Ag '15
Copper shock absorbing shaft, diag Mach 22: 70 S '15
Distance between shaft bearings, B. D. Pinkney, Mach 21:715-16 My '15
Improved form of flexible shaft, diag Iron Age 94:1287 D 3 '14
Method of making a shrink fit. W. Swaren, il Power 40:816 D 8 '14
Rothenbucher compression shaft coupling, il Power 42:620 N 2 '15
Sleeving shrink on worn armature shafts—

Sleeving shrunk on worn armature shafts—rethreading pinion-end threads, diag Elec Ry J 45:720-1 Ap 10 '15

Torsional oscillations of engine shaft; abstract.
O: Mies. diag Am Soc M E J 37:406-7 Jl '15 Sce also Camshafts; Crankshafts; Hoisting machinery; Mine shafts; Power transmission; Shaft gates; Shaft sinking; Shafting

Shafts, Mine. See Mine shafts

Tests of frictional resistance of concrete on shale, E. L. Lasier, il diag Eng N 74:156-8 Jl 22 '15

Shansi railway Railways in China, il Engineer 119:347-8 Ap 9 '15

Sharks

Natural history of the whale shark. E. W. Gudger, il diags Sci Am S 80:230-3, 246-7 O 9-16 '15

Sharpening Automatic band saw sharpener, il Iron Tr R 56:666 Ap 1 '15

Electric edger for safety razors. il diag Elec W 66:711-12 S 25 '15; Elec R & W Elec'n 67:633-4 O 2 '15

67:633-4 O 2 '15
Gear generator tool grinding machine, il Iron
Age 95:1230 Je 3 '15
Imperial drill sharpener, diag Eng & Min J
99:414 F 27 '15
Progress in machine shop methods, E. R.
Norris, Iron Tr R 57:749 O 14 '15; Excerpt
(Resharpening of files) Iron Age 96:1175 N
18 '15

18 15 15 Sullivan drill sharpener, il Eng & Min J 99: 949-50 My 29 '15; Eng & Contr 43:475-6 My 26 '15; Iron Age 95:1287 Je 10 '15 Wonder drill sharpener, il Eng & Min J 100: 191 Jl 31 '15

Shears

Short rivet shear. E. T. Spidy. diags Ry Age (Mech ed) 88:642 D '14

Sheep

Sheep raising in Oklahoma, G: L. Browning, il Textile World 49:591-3 S '15 Sheep dips

Sheep dips in Uruguay. H. L. Spahr. Textile World 48:594; 49:656-7 Mr. S '15

Sheet metal

Sheet metal for building construction. Metal Work 82:737-8 D 4 '14 Sheet metal prevents spread of large fire. S. H. Bunnell, il Metal Work 83:110-12 Ja 8 '15

See also Tin plate

Sheet metal contractors

Making the most of your business. P. F. Brandstedt. Metal Work 83:458-9 Mr 19 '15 Sheet metal contractor's overhead expense. Metal Work 83:423-6 Mr 19 '15

Sheet metal contractors, National association of. See National association of sheet metal contractors

contractors

Sheet metal contractors associations
Chicago sheet metal contractors. Metal Work
83:457 Mr 19 '15
Chicago sheet metal contractors meeting,
Nov. 2. Metal Work 84:627-8 N 12 '15
Illinois sheet metal contractors meet. Metal
Work 83:740-3 My 21 '15
National association of sheet metal contractors' 11th annual convention. Metal Work 83:
890-8 Je 18 '15
Ohio sheet metal contractors' convention. Metal Work 83:858-61 Je 11 '15
Securing and keeping new members. G: E.
Kohlmeyer. Metal Work 83:384 Mr 12 '15
Sec also Michigan state association of See also Michigan state association of sheet metal contractors

Sheet metal machinery. See Metal working ma-

Sheet metal trade

neet metal trade
American sheet metal products in Salvador.
G. Harris. il Metal Work 83:800-1 Je 4 '15
Buying suggestions made by successful men.
Metal Work 83:423-6 Mr 19 '15
Commercial side of the sheet metal business.
P. L. Biersach, Metal Work 83:906-7 Je 18
'15

Co-operation in the sheet metal trade, F. B. Hiller, Metal Work 83:164-5 Ja 22 '15 Cost system of Michigan sheet metal shop. Metal Work 83:802-4 Je 4 '15

Metal branch of National hardware associa-tion annual meeting, May 21-22. Metal Work 83:784-5 My 28 '15

Sheet and tin-plate trades in 1914. B. E. V. Luty. Iron Age 95:10-11 Ja 7 '15

Way to expand the sheet metal trade. Chew. Metal Work 83:786-7 My 28 '15

Sheet metal work
Automobile sheet metal work in western city.
11 Metal Work 84:152-3 JI 30 '15

lenks for rectangular and elliptical shells. F. J. W. Sparkuhl, diags Mach 21;687-8 Ap Blanks

Dies for drawing flanged shells. E. P. Davis. diags Mach 21:532-4 Mr '15

Establishing number of operations for drawing cylindrical shells, F. J. W. Sparkuhl. Mach 21:729-32 My '15

Ford methods and the Ford shops, F. L. Faurote, il Eng M 48:859-76 Mr '15

Sheet metal work—Continued
Formulas for blank diameters of drawn shells.
F. J. W. Sparkuhl. diags Mach 21:373-6 Ja F. J.

Making lamps for Christmas presents. W: Neubecker. il diags Metal Work 82:770-1 D 11

M'14
Miking rack for storage of sheet metal. diags
Metal Work 83:313-14 F 26 '15
Press tools for making a roller bearing cage.
Il diags Mach 21:547-9 Mr '15
Rectangular drawing and trimming. J. M.
Stabel. diags Mach 22:44-7 S '15
Safety in sheet metal operations. il Am Ind
I5:supl-4 Ap '15
Sheet metal window shop in the Southwest. il
plan Metal Work 83:95-7+ Ja 8 '15
Tools for making lamp wick-tubes and burner
caps. R. Toeplitz. il diags Mach 21:1002-3 Ag
'15

Wilzin process for flat-ware manufacture. il Mach 22:76-7, 80 S '15 Wilzin process of flatware manufacture. il Metal Ind n s 13:374-7 S '15

· See also Brass; Cartridge cases; Copper; Dies; Punching machinery; Rolling mills; Shells; Tanks

#### Accounting

Accounting system for roofing business. E. B. Bourlier. Metal Work 83:39-42 Ja 1 '15 Cost system of Denver sheet metal shop, il Metal Work 84:175-6+ Ag 6 '15

#### Exhibitions

heet metal and plumbing work exhibited. il Metal Work 84:546-7 O 29 '15

#### Pattern making

Pattern making
Ball joint for blow-pipe connection. diags
Metal Work \$3:294-5 F 19 '15
Circle to ellipse offset transition piece. diags
Metal Work \$4:616-17+ N 12 '15
Constructing emery wheel exhaust heads.
diags Metal Work \$2:787-9 D 18 '14
Cyclone or centrifugal separator designs. diags
Metal Work \$4:50-1 J1 9 '15
Designing roof flanges for stove pipes. diags
Metal Work \$4:403+ S 24 '15
Developing pattern for roof flange and hood.
diags Metal Work \$4:283 Ag 27 '15
Developing pattern for taper joint. diags Metal
Work \$4:633 N 19 '15
Developing patterns for water pipe lateral.
diags Metal Work \$4:492-3 O 15 '15
Developing roof flange and plate pattern. diags
Metal Work \$4:335 S 10 '15
Faucet boss problem solved by triangulation.
diags Metal Work \$4:245-6 Ag 20 '15
Four-prong fork for pipe of blower system.
diags Metal Work \$3:811-12+ Je 4 '15
Making patterns for cone hopper and spout.
diags Metal Work \$4:463-7 O 8 '15
Pattern for angular boot of varying section.
diags Metal Work \$4:466-7 O 8 '15
Pattern for irregular shaped copper funnel.
diags Metal Work \$4:65-7 O 8 '15
Pattern for irregular shaped copper funnel.
diags Metal Work \$4:65-7 O 8 '15
Pattern for offset in ventilation pipe. Metal
Work \$3:571-3+ Ap 16 '15
Pattern for taper joint by triangulation. diags
Metal Work \$4:450-7 O, 545+ S 17, O 29
'15
Pattern for taper joint by triangulation. diags

'15
Pattern for taper joint by triangulation, diags
Metal Work 84:527 O 22 '15
Patterns for compound curve elbow of copper, diags Metal Work 83:417-19 Mr 19 '15
Patterns for intersecting conical spouts, diags
Metal Work 83:627-9 Ap 30 '15
Patterns for offset Y from circular pipe, diags
Metal Work 84:67-9 J1 I6 '15
Patterns for sheet metal transforming elbow,
diags Metal Work 83:357-8 Mr 5 '15

"The state of the state

Simplified pattern for a Y fitting, diags Metal Work 83:258 F 12 '15

Simplified pattern for metal center boot. W: Neubecker. diags Metal Work 84:669+ N 26

Various constructions of charcoal fire pots. diags Metal Work 84:649-51 N 19 '15

Sheet metal work, Architectural Constructing galvanized iron silo roof, diags Metal Work 83:534-6 Ap 9 '15

Home instruction for sheet metal workers. W: Neubecker. Metal Work 81:97, 166-7, 332-3, 389-90, 456+, 524-5, 681-2, 718-19; 82:457+, 615-16, 667-8; 83:498-9, 665-7, 810+; 84:171-3, 297-8, 423-4, 581-2, 702-4+ Ja 9, 23, F 27, Mr 13, 27, Ap 10, My 22-29, O 2, N 6, 20 '14, Ap 2, My 7, Je 4, Ag 6, S 3, O 1, N 5, D 3 '15.

5, D 3 '15 Laying galvanized corrugated roofing sheets. E. Stern. diags Metal Work 83:844-5 Je 11

Method of laying standing seam roofing. Metal Work 83:497+ Ap 2 '15 Sheet metal for St. Ignatius church, San Francisco, W. A. Douglas, il Metal Work 83:162-3+ Ja 22 '15 Sheet metal gutter construction problems.

5+ 3a 22 15 Sheet metal gutter construction problems, diags Metal Work 83:700-1 My 14 '15 Sheet metal in farm buildings, diags plan Met-al Work 83:181-2+ Ja 29 '15

See also Window frames

### Sheet metal workers

Training apprentice sheet metal workers. O: E. Cluss, Metal Work 83:259-60 F 12 '15

Sheet mills. See Rolling mills

Sheet piling

Concrete anchor piles for steel sheeting. diags Eng N 72:1220-1 D 17 '14 Pulling steel sheetpiles with an inverted steam hammer. il Eng N 73:218-19 F 4 '15

Sheeting. See Sheet piling

Determination of moisture in shellac. J Ind & Eng Chem 7:633 Jl '15

Blanks for rectangular and elliptical shells. F. J. W. Sparkuhl. diags Mach 21:687-8 Ap '15

Dies for drawing flanged shells. E. P. Davis. diags Mach 21:532-4 Mr '15
Establishing number of operations for drawing cylindrical shells. F. J. W. Sparkuhl. Mach 21:729-32 My '15
Formulas for blank diameters of drawn shells. F. J. W. Sparkuhl. diags Mach 21:373-6 Ja

Machine for rough turning shell blanks. il Iron Age 95:1402 Je 24 '15

Age 95:1402 Je 24 '15

Shells (projectiles)

Cleveland shell banding and nosing press. il diags Mach 22:253-4 N '15

Dial feed attachment for large shells. il Iron Age 96:1222 N 25 '15

Hydraulic presses versus power presses for the manufacture of cartridges and shells; abstract. W: Rodger. Am Soc M E J 37: 612-13 O '15

Machine for cutting off copper bands. il diag fron Age 96:243 Jl 29 '15; Mach 21:1020 Ag '15

Machinery for the production of projectiles. il Engineer 120:116-17, 278, 338-9 JI 30, S 17, O 8

Machining high-explosive shells. C. A. Tupper. diag Iron Age 96:306-9 O 7 '15
Machining projectile shells. il diags Iron Age 96:1099-1100 N 4 '15
Metals for shells. Metal Ind n s 13:461 N '15
Shell-case turning lathe with pneumatically-operated clutch. il Sci Am 113:472 N 27 '15
Shell turning and manufacturing lathe. il Iron Age 96:299 Ag 5 '15
Shell with a base-cap that precludes premature explosion. il Sci Am 113:469+ N 27 '15
Shell work engine lathes. il Iron Age 95:1394-5
Je 24 '15

Shells for destroying airships, il Sci Am 112:161 F 13 '15
Shells from European battlefields, il Iron Age 96:186-7 Jl 22 '15

Shells of the calibers now in service. C. A. Tupper. Iron Age 96:1045-8 N 4 '15

Single-purpose lathe for shell work, il Iron Age 96:810-11 O 7 '15 6-in. rotary cutting off machine. il Iron Age 96:126-7 Jl 15 '15

32-in. lathe for large shell work, il Iron Age 96:84 Jl 8 '15  $\,$ 

Three lathes designed for shell work. il Iron Tr R 57:896-7 N 4 '15

See also Projectiles; Shrapnel shells

Shells, Unexploded

Detecting buried shells with induction balance. Sci Am 113:425+ N 13 '15

Sherardizing. See Galvanizing

Shingle mills
Electrically driven shingle mill, il Elec R & W Elec'n 66:1122-3 Je 12 '15

Ship plates. See Plates, Iron and steel

Ship propulsion

Boat design that eliminates bow waves and
wake. C. Hering, il Sci Am 113:325 O 9 '15;
Discussion (Waveless boat), 113:447 N 20

Diesel engine propelled ship, Pacific; abstract W. Kaemmerer. Am Soc M E J 37:601-2

Propulsion; abstract. Am Soc M E J 37:602

Reduction gears on the Pennsylvania, il diags

Int Marine Eng 20:339-40 Ag '15
Relative advantages of turbines, Diesel engine and reciprocating steam engine drive. Int Marine Eng 20:223 My '15; Same. Sci Am S

Submarine power plant. A. Hoar, il Sibley J 30:59-63 N '15 Submarine propulsion, P. H. Berggeen, Sibley J 30:71-2 N '15

Sie also Boilers, Marine; Diesel engines, Marine; Motor ships; Propellers; Ship re-sistance; Steam turbines, Marine; Steam-

Ship propulsion, Electric
Applicability of electrical propulsion to battleships, together with the experience gained with it on the Jupiter: abstract. S. M. Robinson. Int Marine Eng 20:19-21 Ja '15
Application of electricity to propulsion: fifty-foot motor boat equipped with electric drive for experimental purposes. W: T. Donnelly.

il diags Int Marine Eng 20:204-8, 264-6 My-

Electric drive in the navy. Iron Age 94:1517 D

Electric propulsion. Int Marine Eng 20:239 Je

Electric ship propulsion. W. L. R. Emmet. Power 41:657-8 My 11 '15; Abstract. Elec R & W Elec'n 66:826 My 1 '15; Abstract. Elec W 65:1139-40 My 1 '15

W 65:1139-40 My 1 '15
Electrical propulsion on battleships. Int Marine
Eng 20:3 Ja '15
Modern submarines in war and peace. S. Lake.
il Int Marine Eng 20:502-3 N '15
Performance of the electrically propelled collier Jupiter. S. M. Robinson. Eng N 73:393
F 25 '15

F 25 '15
Refinements of turbo-electric propulsion. Elec R & W Elec'n 66:934 My 22 '15
Swedish ship with turbo-electric propulsion.
Am Soc M E J 37:609 O '15
Turbine-electric propulsion for battleships.
Eng Rec 71:607 My 15 '15

See also Electricity on ships

Ship purchase bill
Government ship purchase bill. T. E. Burton.
Sci Am 112:197+ F 27 '15
Government ship purchase bill; a defense of
the administration's policy. J. W. Alexander. Sci Am 112:177+ F 20 '15
On the edge of the maelstrom of war. Sci Am
112:192 F 27 '15
Shipping bill fallacy. Sci Am 112:94 Ja 30 '15

hip resistance
Calculations for ships' forms; light thrown by
model experiments upon resistance, propulsion and rolling of ships. D. W. Taylor. Int
Marine Eng 20:443-5 O '15 (to be cont)
Expansion or contraction of dimensions and
the effect upon resistance. H. C. Sadler.
diags Int Marine Eng 20:11-14 Ja '15
Experimental methods of the German government model tank, "Berlin." Int Marine Eng
20:366, 417 Ag-S '15
Suction between passing ships. S. A. Reeve.
diags Sci Am S 79:31-2 Ja 9 '15
hip yards. See Shipvards Ship resistance

Ship yards. See Shipyards

Shipbuilding

Conversion of cargo vessels into bulk oil carriers. F. K. Ruprecht. Int Marine Eng 20: 165-6, 212-16, 258-9, 309-11, 340-3, 404-6 Ap-S

Davits and the new requirements. H. W. Broady. 11 diags Int Marine Eng 20:260-4, 305-9, 355-8 Je-Ag '15 Failure of British steel ship plates. W. J. B. Wilson. il Iron Age 95:610-12 Mr 18 '15; Abstract. Am Soc M E J 37:57-8 Ja '15 Future bright for eastern shipyards. Iron Age 95:404-5 F 18 '15

Higher battleship bids. Iron Age 96:1228-9 N Introduction of a modern method in shipbuilding. W: Brown. diags lnt Marine Eng 20: 163-5 Ap '15

Lloyd's register shipbuilding returns. Engineer

Lloyd's register snipbunding returns.

120:86 Jl 23 '15

Merchant shipbuilding in 1914 and the outlook. Iron Age 95:361 F 11 '15

Output of Japanese shipyards in 1914. il Int Marine Eng 20:170 Ap '15

Shipbuilding in navy yards. Int Marine Eng 20:224-5 My '15

Shipbuilding in 1914. Engineer 119:135-6 F 5

Shipbuilding in the United Kingdom in 1914. diags Int Marine Eng 20:58 F '15
Shipbuilding in the United States in 1914. Int Marine Eng 20:34-5 Ja '15
Small production of merchant ships. Iron Age

Small production of merchant ships, from Age 95:849 Ap 15 '15
Surprising failure of steel ship plates. Int Marine Eng 20:50-1 F '15
Technical aspects of shipbuilding contracts. H. Bocler, Int Marine Eng 20:465-6 O '15
Unusual conversion; racing schooner Rainbow turned into a trading schooner, il diag Engineer 119:177-8 F 19 '15
World's shiphuilding Sci Am S 80:32 Jl 10 '15 meer 119:177-8 F 19 '15 World's shipbuilding. Sci Am S 80:32 Jl 10 '15

Sci as Shipbunding. Sci Am S 80:32 Jl 10 '15
See also Car ferries; Launching; Marine
engines; Motor ships; Naval architecture;
Propellers; Ship propulsion; Ship resistance;
Ships—Repair; Shipyards; Steamboats; Submarine boats; Tank ships; Towboats; Warships; Yachts

# Study and teaching

Questions and answers for marine engineers. See monthly numbers of International ma-rine engineering

From to f goods

Frompt shipment—what does it mean in business contracts. E. J. Buckley. Elec R & W Elec'n 66:530 Mr 20 '15

Recording export shipments; how the detail instructions of different foreign buyers are preserved. H. A. Russell. Iron Age 96:930 O

Retailing steel mill products. il plan Iron Tr R

56:85-71 Ja 7 '15 Shipping 2000 Ford cars a day, M. Braun, il plan Automobile 33:646-9 O 7 '15 Where the delivering agent falls down, D. C. Davis, Ry Age 58:966 My 7 '15

See also Packing for shipment

Shipping

Review of the year 1914: merchant marine. Sci Am 112:6 Ja 2 '15 Searching for contraband with X-rays. il Sci Am 112:338 Ap 10 '15

See also Commerce; Freight handling; Ports; Seamen's bill; Shipbuilding; Shipment of goods; Ships; Steamboat lines; Steamboats; Terminals; Waterways

# Great Britain

British shipping tonnage. Sci Am S 79:360 Je Lloyd's annual report. Int Marine Eng 19:530-1

D'14 Lloyd's regis 225-6 Mr 5 register of shipping. Engineer 119:

## United States

American oversea trade, R. D. Williams, Iron Tr R 56:17-20 Ja 7'15 Decline of our merchant marine, Sci Am 113: 136 Ag 14'15

Fair field and no favor. Sci Am 112:284 Mr 27

Shipping—United States—Continued Problem of our merchant marine, C: Deepsee, Sci Am 111:455 D 5 '14 Profit in the Panama steamships, L. Nissen, Am Ind 15:31 Mr '15

Sharp passage on merchant marine at the National foreign trade council. Iron Age 95:247-8 Ja 28 '15 Special nav

oecial naval reserve and the merchant marine. H. L. Aldrich, Int Marine Eng 20: 145 Ap '15

Storage rule for exports. Iron Age 95:254 Ja

See also Ship purchase bill

Shipping trusts
Dissolution suits brought by government
against shipping combines, Iron Tr R 56:
388g-388h F 18 '15

Ships

hips
Classification of ships. A. R. Liddell. Int
Marine Eng 20:441-2 O '15
New ships needed for the Coast and geodetic
survey. Int Marine Eng 20:2-3 Ja '15
Speed control on dreadnought Pennsylvania. il
Int Marine Eng 20:200-1 My '15
Typical ships. il diags plan (supp) Engineer
117:366-70; 118:229-32, 359-62, 573-5 Ap 3, S
4, O 16, D 18 '14

4, O 16, D 18 '14

See also Car ferries; Coaling vessels; Electricity on ships; Freight ships; Ice-breaking vessels; Launching; Light ships; Motor ships; Naval architecture; Navies; Navigation; Propellers; Refrigeration in transportation; Repair ships; Revenue cutters; Safety at sea; Sailing vessels; Salvage ships; Ship resistance; Shipbuilding; Shipping; Ship resistance; Shipbuilding; Shipping; Shipwrecks; Steamboats; Submarine boats; Tank ships; Torpedo boat destroyers; Torpedo boats; Towboats; Warships; Yachts

Lighting

Lighting of ships. L. C. Porter, il Gen Elec R 18:143-6 F '15; Same, Int Marine Eng 20: 336-8 Ag '15

#### Models

Naval engineering ship models. F. Van Vleck. Int Marine Eng 20:22 Ja '15

Repair

How to avoid big repair bills, "Old Scotch." Int Marine Eng 20:267 Je '15 Repairing the Gulflight. il Sci Am 113:318 O 9 '15

Torpedo damage to the oil tanker Gulflight. il Int Marine Eng 20:520-1 N '15

#### Sanitation

Steam disinfection for sewage on common carriers, diag Eng Rec 71:43 Ja 9 '15; Same (Sewage treatment on trains and boats). Eng M 48:917-18 Mr '15

# Stability

Eastland disaster and vessel stability. R. A. Towler. Eng N 74:516-17 S 9 '15

Electric stabilizer for steamships. Elec R & W Elec'n 67:290-1 Ag 14 '15

Electrically driven gyroscope in marine work. H. C. Ford. il Am Inst E E Pro 33:873-87 Je '14; Same. Sci Am S 78:268-9, 284-5 O 24-31 '14; Same cond. Eng M 47:911-13 S '14; Discussion. Am Inst E E Pro 33:1890 D '14

Safety of lake and coastwise passenger steamers. C. D. Irwin. Sci Am 113:271 S 25 '15

Stability of vessels as affected by damage due to collision. W: Gatewood. Int Marine Eng 20:156-8 Ap '15

Water-ballast tanks and the Eastland disas-ter. F. R. Harris. Eng N 74:467-8 S 2 '15

Ships, Iron and steel Shallow draft boat for the Yangtse Kiang, plans Int Marine Eng 20:490-2 N '15

Ships, Speed of Formula for estimating the speed of a boat. Int Marine Eng 20:360 Ag '15

Shipwrecks

Repairs to lake freighter H. M. Hanna, Jr. il Int Marine Eng 19:554-6 D '14

See also Collisions at sea; Salvage; also Eastland (steamship)

Shipyards

Shipyard at Prince Rupert terminal, W: T.
Donnelly, il diags Int Marine Eng 20:120-2 Mr '15

Shock absorbers

Absorbers
Absorber permits limited free motion. diags
Automobile 33:802 O 28 '15
Friction disks in new Hartford absorber. il
Automobile 31:1265 D 31 '14
Jenney shock absorber. il Automobile 33:522
S 16 '15
New J. M. shock absorber. il Automobile 32:
994 Je 3 '15

Shoddy Shoddy in woolen fabrics. K. B. Lamb. il Tex-tile World 49:154-6 My '15

Shoe cloth

English, Belgian and German shoe cloths. Textile World 48:388-9 Ja '15

Shoe factories

Electricty in a Massachusetts shoe factory. T: D. Bond. il Elec W 66:88-90 Jl 10 '15

Shoes

Shoe-button attaching machine. il diag Sci Am 112:410 My 1 '15

Shone ejectors. See Sewage ejectors

Shooting

Whiplash crack and bullet sound waves. H. P. Maxim. il Sci Am 113:231 S 11 '15 See also Range finding; Rifle ranges

Shooting, Military
Accuracy of fire; the principal causes affecting the fire of big guns. H. J. Jones. Sci Am S 80:291 N 6 '15
Indirect fire. E. Vallier. Eng M 50:454-5 D '15

Shop hospitals. See Hospitals, Factory

Shop management
Best methods of dealing with men. H. E. Gamble. Ry Age (Mech ed) 89:61 F '15
Conservation of material in the railroad repair shop. E. Cordeal. Eng M 48:827-32 Mr

'15
Expert in the railroad repair shop. E. Cordeal.
Eng M 49:351-6 Je '15
Railroad locomotive repair shop organization.
H: Gardner. Ry Age 59:697-9 O 15 '15
Shop management and what it means. E. W. Wallbank. Foundry 43:299-300 Ag '15
Standardization of methods in the railroad shop. E. Cordeal. Eng M 48:722-7 F '15
Wage systems in the railroad repair shop. E. Cordeal. Eng M 49:51-7 Ap '15
See also Factory management'. Foundry

See also Factory management; Foundry management; Machine shop management; Organization in industry; Scientific management

Shops

See also Blacksmith shops; Bridge shops; Carpenter shops; Electric railroads—Shops; Locomotive shops; Machine shops; Mine shops; Plumbing shops; Railroads—Shops

Shops, Repair. See Repair shops

Shops, Repair, see Repair shops

Shore protection
Coast erosion and protection on Long Island
and New Jersey. G. O. Case. map Eng N
74:348-51, 388-91, 438-42 Ag 19-S 2 '15
Concrete bleachers protect Massachusetts
shores; defense works at Revere beach. il
diags Eng Rec 71:429, 628 Ap 3, My 15 '15
Design of shore-protection works. R. Bennett.
diags Eng N 74:98-101 Jl 15 '15; Abstract.
Eng M 50:466-8 D '15

Design suggested for shore-protection works on the New Jersey coast. B. F. Cresson, ir. diags Eng N 73:004-5 My 6 11: Eng Rec 71:547-8 My 1 15

Fighting the sea with compressed air. R. G. Skerrett. il Sci Am 112:97 Ja 30 '15

Flooring the sea with concrete. W. J. L. Kiehl. il Sci Am 113:461 N 27 '15

San Francisco shore protection, diags Eng N 74:571 S 16 '15

See also Bulkheads; Flood control; Rivers—Regulation; Sea walls

Shoring and underpinning
Heavy needling for 450-ton column loads for
subway underpinning, il diags Eng Rec
71:565-6 My 1 '15

Shoring and underpinning—Continued
Jacking up a concrete arch over a settling
pier. W. P. Darwin, il Eng N 73:588-9 Mr 25

Large number of light needles hold 606-ton brick wall, diag Eng Rec 72:87-8 Jl 17 '15 New adjustable shore, il Concrete Cem 7:46-7 Jl '15 New York rapid transit railway extensions. F. Lavis, il diags Eng N 72:1150-5 D 10 '14 Rebuilding elevated railways in New York city, il diags Eng N 74:630 S 30 '15 Righting a twenty-thousand-ton grain elevator, il Sci Am 111:524 D 26 '14 Righting the tilted grain elevator of the Canadian Pacific Ry, il Concrete Cem 6:196 Ap '15

freezing weather at Detroit, il Cem 6:197 Ap '15 oil tests reported and safe und methods in second building during Shoring

Cem 6:197 Ap '15 Soil tests reported and safe underpinning methods in sand described. J: F. Greathead. diags Eng Rec 72:631-3 N 20 '15 Steel shields protect traffic during removal of New York subway roof. il Eng Rec 72:110-12 Jl 24 '15

See also Building; Subway timbering

Short ballot

Good government and popular government getting together, H. S. Gilbertson, Am Ind 15:15-16 Ap '15 List of short ballot cities, Munic J 38:696 My 20 '15

Short circuits Calculation of sudden short circuit phenomena of alternators. N. S. Diamant. diags 6 pls Am Inst E E Pro 34:2043-79 S '15 Mechanical effects of electrical short-circuits. S. H. Weaver. Gen Elec R 18:1066-74 N '15

Shot iron. See Iron founding

Shoveling machines

hoveling machines
Gasoline shovels are auxiliary to steam equipment. il Eng N 74:798-9 O 21 '15; Same. Eng & Min J 100:806-7 N 13 '15
Halby shoveling machine for underground mining. il Eng & Min J 99:950 My 29 '15; Iron Tr R 57:266 Ag 5 '15
Power scraper shovel for ore boats. il Iron Age 96:1115-16 N 11 '15

See also Electric shovels; Steam shovels

Adjustable pole-hole digger. il Elec W 66: 1049-50 N 6 '15
Economic choice of shovels for handling different classes of material, C. W. Hartley, Eng & Contr 43:302-3 Mr 31 '15 See also Shoveling machines

Shovels, Electric. See Electric shovels

Shovels, Steam. See Steam shovels

Show windows

Campaign for increasing hours of show-window lighting. Elec R & W Elec'n 66:680 Ap 10

'15
Co-operative power customers' display at Hartford. il Elec W 65:303 Ja 30 '15
February window displays, A. J. Edgell. il Elec W 65:234 Ja 23 '15
Master plumber and the show window. il Metal Work 83:349-50 Mr 5 '15
New Year window display. A. J. Edgell. il Elec W 64:1267 D 26 '14
New York appliance salesroom attracted many Christmas shoppers, il Elec W 65:117 Ja 9 '15
Preventing steaming of show windows. diag Metal Work 83:152 Ja 22 '15
Prismatic-glass window reflector. il Elec R & W Elec'n 67:440-1 S 4 '15
Show-window lighting in war time. J. S. Dow, il Am Gas Light J 102:305 My 17 '15
Stimulating sales by window displays, J. P. Zingg, il plans Metal Work 83:564-8+ Ap 16 '15

Successful merchandising for the plumber. H. Whitehead. Dom Eng 70:78-9 Ja 16 '15 Talking show window. il Sci Am 113:431 N 13

Using a store entrance for night displays: elevated show windows. il Sei Am 112:155-6 13 '15

Value of window display. Am Gas Light J 103: 52-4 Jl 26 '15

Window displays boost regulator sales. il Met-al Work 83:46-8 Ja 1 '15

Shower baths

Shower baths in the schools. J. Graham. il diags Dom Eng 70:233-5 F 20 '15 Shower equipment in Jersey schools. plans Metal Work 83:837 Je 11 '15

See also Bath cars

Shrapnel shells

Ammunition components, United States army
—principle dimensions and general specifications, Iron Age 96:sup358a Ag 12 '15
Banding and nosing press for shrapnel, il Iron
Age 96:1104 N 4 '15
Cast vs. forged shrapnel casing. Foundry 43:

298-9 Ag '15
Collapsing adjustable shrapnel tap, il Iron
Age 96:745 S 30 '15
Collapsing tap for shell work, diag Iron Tr R
57:447 S 2 '15

57:447 S 2 '15 Details of Russian shrapnel. H. M. Davis. Iron Age 96:797 O 7 '15 Die head for threading shrapnel parts. il Iron Age 96:981 O 28 '15 Equipment for forging shrapnel cases, C. A. Tupper. Iron Age 96:512-14 S 2 '15 Ford-Smith shrapnel shell grinder, il Mach 22: 68-9 S '15

68-9 S '15 Forging shrapnel shells. 'D. T. Hamilton. il diags Mach 21:614-18 Ap '15; Same. Sci Am S 79:404-6 Je 26 '15 14-in. heavy automatic shrapnel lathe. il Iron Age 95:454 F 25 '15 Grinding center bosses from shrapnel. il Iron Age 96:568 S 9 '15 Grinding large shells and projectiles C. O. Grinding large shells and projectiles C. O.

Age 96:568 S 9 '15
Grinning large shells and projectiles. C. O. Smith. il diags Iron Age 95:445-7 F 25 '15
Heat-treatment and testing of shrapnel shells.
J. M. Wilson. diags Mach 22:28-31 S '15
Heavy single operation shell lathe. il Iron Age 96:82 Jl 8 '15
Hydraulic nosing and banding presses. il Mach 22:72 S '15
Machining and assembling shrapnel cases.
C. A. Tupper. diags Iron Age 96:570-3 S 9 '15

Machining of a shrapnel shell case: the Reed-Prentice system, diags Iron Age 95:73-4 Ja 7 '15

Machining shrapnel shells. D. T. Hamilton il Mach 21:619-39 Ap '15; Same abr. Sci Am S 80:12-13 Jl 3 '15

Machining shrapnel shells; tool equipment used on the Potter & Johnston automatic chucking and turning machine. il diags Mach 21:572-5 Mr '15
Making cartridge cases. D. T. Hamilton, il

Making cartridge cases. D. T. Hamilton, il diags Mach 21:651-6 Ap '15; Excerpt. Sci Am S 80:29-30 Jl 10 '15 Making fuse parts. il diags Mach 21:641-50 Ap

Manufacture of shrapnel, il diag Metal Ind n s 13:137-9 Ap '15

Pneumatic press for banding shrapnel, il Iron Age 95:1398 Je 24 '15

Shrapnel and shrapnel manufacture, D. T. Hamilton, il diags Mach 21;609-13 Ap '15; Same, Sci Am S 79:385-8 Je 19 '15; Abstract, Eng M 49:416-19 Je '15

Special shrapnel cutting-off machine, il Iron Age 96:193 Jl 22 '15

Spraying shrapnel shells, il Iron Age 96:355 Ag 12 '15

Trimming machine for shrapnel shells. il Iron Age 95:1225 Je 3 '15

Vertical milling machine for shrapnel, il Iron Age 95:1281 Je 10 '15

Victor shrapnel shell tap, il diag Mach 22:70 S

Shrinking. See Fitting (machinery)

Shrubs

Selecting trees and shrubs. Am For 21:591-3 Ap Siberia

Opportunities for electrical manufacturers in Siberia. Elec W 65:267 Ja 23 '15

Topographic features of Siberia. C. W. I ton. il maps Econ Geol 10:453-61 Jl '15 Puring-

Trip to the Siberian-Mongolian frontier. N. Knox. il Eng & Min J 98:1027-33 D 12 '1

Siberia - Continued

Industries and resources

Ridder mine of the Irtysh corporation, il map Eng & Min J 99:599-603 Ap 3 '15

Siberian railway
Connecticut to Poland by the way of the Pacific; how munitions are shipped to Russia across Asia. H: H. Suplee, map Sci Am 113: 115 Ag 7 '15 Vladivostok open all the year. J. K. Caldwell. Sci Am 113:487 D 4 '15

Sibley, Missouri

Bridges

New bridge across the Missouri river at Sibley, il diags Ry Age 59:13-16 Jl 2 '15

Sibley college. See Cornell university. Sibley col-

Sicily. See Geology-Sicily

Sidewalks

idewalks
Construction details and costs. Munic J 38:153-9 F 4 '15
Cost of resurfacing macadam walks with as phalt, Lincoln park, Chicago. M. D. Blumberg. Eng & Contr 43:512-13 Je 9 '15
Sidewalk problem; its solution in Pawtucket, Rhode Island. Eng N 73:843 Ap 29 '15
Sidewalk work in Cincinnati. D. L. Barr. Munic J 38:763-6 Je 3 '15
Sidewalks in cities, 1915; tabulation. Munic Eng 48:261-2 Ap '15
Street and sidewalk improvement in the United States and Canada; tabulation. Munic Eng 48:352-8 Je '15
See also Payements

See also Pavements

Sidewalks, Concrete

Costs and methods on the construction of a large concrete sidewalk, Harrisburg, Pa. J. D. Justin. Eng & Contr 44:166-7 S 1 '15 Destruction of cement sidewalks by trolley poles. C. H. Fuller, Elec Ry J 46:832-3 O 16 '15

Expansion in concrete sidewalks. Munic J 38: 770-1 Je 3 '15

Making concrete walks on the farr Wilson, il diag Bldg Age 37:71 F '15 farm. P. H.

Splitting of concrete sidewalks surrounding iron posts. C. H. Fuller and others. diag Concrete Cem 6:246-8 My '15

Sleges

Mining and countermining of fortifications. il Sci Am 111:464-5 D 5 '14

Architecture

American academy in Rome; the Palazzo Piccolomini at Siena. K. E. Carpenter. il Am Inst Arch J 3:182-3 Ap '15

Sieves

Standardization of no. 200 cement sieves. R. J. Wig and J. C. Pearson, pls U S Bur Stand Tech Pa 42:1-51 '14

Sight

Minimum visual angle. Sci Am S 80:93 Ag 7

Recent experiments on vision in animals. H. M. Johnson, bibliog Illum Eng Soc 10: 502-14 no 6 '15

ésumé of the physical, physiological and psychic phases of vision, N. M. Black, diags Illum Eng Soc 10:562-86 no 7 '15 Résumé

Visual pattern-discrimination in the verte-brates: difference-threshold for band-width in the monkey and the domestic chick. H. M. Johnson. J Fr Inst 180:238-40 Ag '15

See also Color sense; Eye; Spectacles Sights for firearms. See Firearms-Sights

Signals

New hydrographic signal of the U.S. coast
and geodetic survey. diags Eng N 74:27-8 Jl
1 '15

Signaling apparatus used by airships, il Sci Am 113:265 S 25 '15

See also Aeronautics-Signals; Automobile signals; Electric railroads—Signals; Electric signals; Fire alarms; Fog signals; Light sig-nals; Pneumatic signals; Railroads—Signals; Telegraph; Time signals; Wireless telegraph Signals, Electric, See Electric signals

Signals, Mine. See Mine signals

Signals, Pneumatic. See Pneumatic signals

Signals, Railroad. See Railroads-Signals

Signals, Submarine, See Submarine signals

#Holder for danger signs, J. E. Cooley, il Eng & Min J 100:477 S 18 '15 New type of illuminated sign, il Illum Engr 8:400-1 S '15

See also Car signs; Electric signs; Road signs; Street signs

Silage. See Ensilage

Silence, See Sound

Silica, Fused

Fused silica dishes for the concentration of sulphuric acid. A. E. Marshall, diag Met & Chem Eng 13:136-7 Mr '15

Heat transmission capacity of a silica dish. W. K. Lewis, il diag J Ind & Eng Chem 7:410-14 My '15

Silica brick. See Fire brick

Silicate of soda. See Sodium silicate

Hydration of Portland cement. A. A. Klein and A. J. Phillips, pls U S Bur Stand Tech Pa 43:3-71 '14

Silicon oxycarbide. See Fibrox: Silundum

Silicon steel

Longest simple truss span in world to be erected over Ohio river at Metropolis. diag Eng Rec 72:53-4 Jl 10 '15; Abstract (Silicon steel for bridge construction). Eng M 49:913

Ohio river bridge for the C., B. & Q. R. R. diag Eng N 74:230-2 Jl 29 '15

World 50:213 N '15
International classification of raw silks by its defects, W. P. Seem. Textile World 48:485-8, 579-81: 49:81-4, 157-9, 326-8 F-Je '15
Silk culture in America. C: A. Byers. il Textile World 49:332-4 Je '15
Streaks in silk goods. Textile World 49:102-3 Ap '15

See also Textile industry and fabrics

Dyeing

See Dyes and dyeing-Silk

Silk, Artificial

Dyeing artificial silks. E. C. T. Bick. Textile World 49:119-20 Ap '15 Formula for treating artificial silk. Textile World 48:328 D '14 Manufacture of artificial lustrous threads by the viscose process. W. F. Cooper. Textile World 50:129-30 O '15

Silk convention, National. See National silk convention

Silk machinery Machine for shearing or picking silk goods. il Textile World 49:377-8 Je '15

Sill ties. See Railroad ties

Sil-O-Cel powder. See Celite

hemical changes during silage formation. R. E. Neidig. Am Chem Soc J 36:2401-13 N Chemical

Constructing galvanized iron silo roof. diags Metal Work 83:534-6 Ap 9 '15

Concrete

Building concrete silos—monolithic construc-tion—types of commercial equipment. C. D. Gilbert. il diags Concrete Cem 7:58-62, 82-3

Ag '15
Building concrete silos—the plastered silo. il
Concrete Cem 7:122-4 S '15
Building concrete silos—unit construction
with blocks and staves; with cost tables.
C. D. Gilbert. il diags Concrete Cem 7:3-6, 37-8 Jl '15

Concrete silos are preferred in Missouri, Concrete Cem 7:113 S '15

Methods and costs in constructing a combined concrete silo and water tank, il diag Con-crete Cem 6:162-4 Mr '15

Silos, Concrete—Continued

Methods used in constructing a 108-ft. monolithic concrete silo near Salona, Pa. il diags
Concrete Cem 6:301-2 Je '15
Silo form with new features. il Concrete Cem
7:126-7 S '15

Solving the silt problem: reservoirs suggested for muddy streams of the Southwest. L: C. Hill, Eng Rec 70:609-10 D 5 '14

Silundum

Preparation, properties and composition of silundum. S: A. Tucker and A. Lowy. il diags J Ind & Eng Chem 7:565-71 Jl '15

Silver

Action of finely divided silver on a-bromoand a-odopalmitic acids: synthesis of two
isomeric ditetradecylsuccinic acids. D. B.
Jones. Am Chem Soc J 37:586-94 Mr '15
Experiments in the enrichment of silver ores.
L: G. Ravicz. Econ Geol 10:388-89 Je '15
Gold and silver statistics. F: Hobart. Eng &
Min J 99:47-8 Ja 9 '15
Milling at the Nipissing mines co. Eng & Min
J 99:1124 Je 26 '15
New crystalline variety of silver. T. C. Choudhri. Am Chem Soc J 37:2037-9 S '15
Occurrence of silver in argentiferous galena
ores. A. E. Nissen and S: L. Hoyt. pls Econ
Geol 10:172-9 F '15
Potential of silver against silver ion in concentrated solutions of potassium and of so-

centrated solutions of potassium and of so-dium chloride, and its relation to the activi-ties of such solutions. G: S. Forbes and F: O. Anderegg. Am Chem Soc J 37:1676-85 Jl '15

Treatment of waste material containing silver. R. J. Marsh. Metal Ind n s 13:314-17 Ag '15 See also Cyanide process; Silver metal-lurgy; Silver mines and mining; Silver plat-ing; Silver salts; Silverware

Silver assaying

Determination of silver in ores and concentrates containing platinum and palladium.

A. M. Smoot. Eng & Min J 99:701 Ap 17 '15 Gold and silver assaying. S. Fischer, jr. Met & Chem Eng 12:771-3 D '14

Silver iodide

roperties of silver iodide interpreted in re-Pation to recent thermodynamic conceptions. G. Jones and M. L: Hartmann. diag Am Chem Soc J 37:752-75 Ap '15

Silver metallurgy
Chloridizing blast roasting and leaching. G. A.
Keep. il diag Eng & Min J 99:265-9, 315-22
F 6-13 '15

F 6-13 '15 Chloridizing ores at Silver City, Utah. il diag Met & Chem Eng 12:757-9 D '14 Desilverizing copper matte with lead. Eng & Min J 98:1046 D 12 '14 Lead acetate and zinc salts in silver extraction. C: R. Morris. Eng & Min J 100:189-90 H; 31 '15

Ji 31 '15
Phillips process for treating cobalt-silver ores.
Eng & Min J 99:1120 Je 26 '15
Progress in gold and silver metallurgy in 1914.
Met & Chem Eng 13:3-5 Ja '15
Recovery of mercury from amalgamation tailing. Buffalo mines, Cobalt; with flow sheet.
E. B. Thornhill. Am Inst Min E Bul 104:1653-7 Ag '15; Abstract. Met & Chem Eng 13:330-1, 873 My, N 15 '15 E. B. 7 Ag '15; 1 873 My, also

See also Cyanide process

Silver mines and mining

Alta activities. il Eng & Min J 99:689-90 Ap

Coniagas mines; report for year ended Oct 31, 1914. Eng & Min J 99:197 Ja 23 '15 Fond du Lac silver strike: discovery not veri-fied. G. C. Bateman. Eng & Min J 99:78'

My 1 '15 Gold and silver in Chile, M. R. Lamb, il Eng & Min J 99:847-9 My 15 '15 Tonopah in 1914. F: Bradshaw, Eng & Min J 99:154-5 Ja 16 '15 Volcano, a new Nevada strike, F. C. Lincoln, il Eng & Min J 100:73 Jl 10 '15

Silver nitrate

Potential of silver in nonaqueous solutions of silver nitrate. V. L. Gibbons and F. H. Get-man. bibliog diags Am Chem Soc J 36:1630-55 Ag '14

Use of silver nitrate as a testing agent. Int Marine Eng 20:85 F '15

Silver nitrite
Determination of the solubility of silver nitrite and its degree of dissociation in a saturated solution. H: J. M. Creighton and W: H. Ward. Am Chem Soc J 37:2333-8 O '15

Silver plating

Making the silver solutions. O. A. Hillman. Metal Ind n s 13:416-17 O '15 Silver solution assay. E. J. Hall. Metal Ind n s 13:154 Ap '15

See also Electroplating; Silvering

Silver salts ew hydroxyurethanes and chromoisomeric silver salts of their acyl derivatives. L. W: Jones and R. Oesper. Am Chem Soc J 36: 2208-23 O '14

2208-23 O 14
Relative solubility of certain silver salts.
A. E. Hill. Am Chem Soc J 37:510-13 Mr 15
Solubility of certain difficulty soluble silver
salts. A. Thiel. Am Chem Soc J 37:508-10

Silvering
Protecting silvered mirrors by copper plating.
il diag Sci Am S 79:28 Ja 9 '15

Silverware
South American market for jewelry
silverware. U S Sp Cons Rep 70:1-23 '15

Si Maloe

Logging Rasak and Lagan. T. R. Helms. il Am For 21:1050-3 N '15

Sinking funds
Premium or discount on bonds in sinking
fund. S. Walton. J Account 19:390-2 My '15
Sinking funds in rate valuations. W. H. Lawton. J Account 19:191-7 Mr '15

Sintering

intering
Flue dust sintering plant at Gary, Ind. il plan
Iron Age 95:1168-70 My 27 '15
Mechanical progress of sintering. B. G. Klugh.
diags Iron Tr R 57:835-8+ O 28 '15; Same.
Iron Age 96:1000-4 O 28 '15; Discussion.
H. A. Brassert. Iron Tr R 57:845 O 28 '15;
Discussion. R. E. Brooke; H. A. Brassert.
Iron Age 96:1004-5+ O 28 '15
New sintering plant at Gary, Ind. plan Eng
& Min J 100:107 Jl 17 '15
Rotary sintering kilns at Gary. H. C. Estep.
il diag Iron Tr R 56:1020-2 My 20 '15
See also Dwight-Lloyd process

See also Dwight-Lloyd process

Design and construction features of reinforced concrete sewer siphons under New York subways. T. L. Wilson. Eng & Contr 43:128-

9 F 10 '15

Method and cost of constructing an inverted sewer siphon of 12 in. cast iron pipe, encased in concrete, beneath small stream at Carlisle, Pa. C. A. Bryan. diag Eng & Contr 42: 151-3 Ag 12 '14

Syphoning water from series of drilled wells to a common pump well at Kokomo, Ind. O. O. Jones. plan Eng & Contr 43:191 Mr 3'15

Why does the siphon break? diags Dom Eng 72:173 Ag 7 '15

Sirups. See Syrups

Sizing (textiles). See Cotton sizing

Skim gate. See Foundries-Equipment and sup-

κι ο επεστ
Experimental researches on skin effect in conductors. A. E. Kennelly, F. A. Laws and P. H. Pierce. ii diags Am Inst E E Pro 34: 1749-1809; Bibliog. 1809-14 Ag '15
Skin effect in bimetallic wires. J: M. Miller. Elec W 65:1612-13 Je 19 '15

Skykomish basin, Washington Petrology and economic geology of the Sky-komish basin, Washington, W. S. Smith. il map Sch Mines Q 36:154-85 Ja '15

Skylights

Flat skylight on structural steel frame, diags Metal Work \$3:779-31 My Improved skylight. W: C. Work 84:550 O 29 '15 C. Linton. il Metal

New type of skylight construction, diag Iron Age 96:1164 N 18 '15

Skyscrapers. See High buildings

Slabbing machine Vertical slabbing machine, il Iron Tr R 56:1105 Je 3 '15

Slag
Action of fluorspar on basic open-hearth slags.
W. S. Hamilton. Met & Chem Eng 13:8 Ja '15
Advantages of high-lime slags in the smelting
of lead ores. S. E. Bretherton. Am Inst Min
E Bul 104:1595-9 Ag '15; Discussion. 108:
2479-81 D '15
Blast furnace slag for railway ballasting. il

2479-81 D'15
Blast furnace slag for railway ballasting, il plan Engineer 120:395-6 O 22 '15
Blast furnace slag handling system. F. L. Prentiss, il Iron Age 95:1396-8 Je 24 '15
Characteristics of slag and chat ballast. P. H. Hamilton. Ry Age 58:1437-8 Je 18 '15
Handling iron and cinder at the blast furnace. J. E. Johnson, jr. il Met & Chem Eng 13: 85-9 F '15
High phosphorus slag from open-hearth or

85-9 F 15
High phosphorus slag from open-hearth or
electric furnaces. Iron Age 96:295 Ag 5 '15
How to make steam from slag. W. L. Johnson,
diags Iron Tr R 55:1139-40 D 17 '14
Kennedy slugger type crusher, il Iron Tr R
57:27 Jl 1 '15

57:27 Jl 1 155
Making money from furnace slag. il Iron Tr
R 56:1318-19 Je 24 '15
Metal loss in copper slags. F. E. Lathe. Eng
& Min J 100:215-17, 263-8, 305-8 Ag 7-21 '15
Slags from titaniferous ores. F. E. Bachman.
diag Iron Tr R 55:1040-2 D 3 '14
Special type of slag handling crane. il Iron
Age 95:939 Ap 29 '15
Use of blast furnace slag as an aggregate in
concrete. Concrete Cem 5:247-9; 6:210-11 D
'14 An '15

concrete.

'14, Ap '15
Zinc oxide from lead blast furnace slag, as in operation at south Chicago. H. B. Pulsifer. il Met & Chem Eng 13:783-5 N 1 '15

See also Blast furnaces

### Transportation

Tariffs on waste materials stricken out. Ry R 57:40-1 Jl 10 '15

Slag settlers

ag settlers
Granby tapered settler, F. E. Lathe, diags Eng
& Min J 100:270 Ag 14 '15
Lead smelting at El Paso, H. F. Easter, Am
Inst Min E Bul 104:1493-1506 Ag '15; Excerpts (Oil-fired settlers at El Paso) Eng
& Min J 100:356-7 Ag 28 '15

Quarrying slate for structural purposes. il Metal Work 84:445-6 O 1 '15

Use of slate as a roofing material, J. C. Taylor, Bldg Age 37:46 Mr '15

Slaughtering and slaughter houses Municipal abattoirs. Munic J 39:252-3 Ag 19

Sleeping cars
Ventilation of sleeping cars. T: R. Crowder.
Ry Age (Mech ed) 89:464-6 S '15

Wisconsin berth law annulled. Ry Age 59:12

## Equipment

Sleeping car towel receptacle, plan Ry Age 59: 572 S 24 '15

Sleeping porches
Details of pocket window frame. W. S. Wilkin.
diags Bldg Age 37:56-7 Ag '15

Slick, Edwin E. Inventor, engineer, executive. C. F. Williams. por Iron Tr R 56:179+ Ja 21 '15

Barth slide rule for pulp measurement. C. G. Barth, jr. il Eng & Min J 100:228 Ag 7 '15

How to read a slide rule. diags Power 42:192-4 Ag 10 '15

Logarithmic scales made from worn-out slide-rule, F: W. Salmon, diags Mach 22:146 O rule. F:

New friction head slide rule for heating work and power piping. diags Heat & Ven 12: 50-1 Ap '15

Quick solar reduction by slide rule. il Eng N 74:267 Ag 5 '15; Same. Eng & Min J 100:353 Ag 28 '15

ailway motor characteristic curves. E Kimball, il Gen Elec R 18:296-9 Ap '15 Railway

Simple solution of a quadratic equation by slide rule, S. Shaw. Eng Rec 71:754 Je 12

Slide-rule quadratics, R. N. Miller, Power 42: 422-3 S 21 '15 Strength computing slide rule for reinforced concrete beams and slabs, il Concrete Cem 7:88 Ag '15

Slide valves Slide valve lubrication on the Buffalo, Roches-ter & Pittsburgh. diags Ry Age 59:283-4 Ag 13 '15

Slides. See Earthwork-Slides

Slime. See Ore pulp

Slings and hitches

lings and hitches
Care and use of hoisting accessories: wire
rope, manila rope, hooks, chains, accessories,
lubrication of wire rope, strength of slings.
Mach 21:297-8 D '14
Unusual rigging used to set heavy turbine parts
in close quarters. F. M. Biersach. diags Eng
Rec 72:24-5 J1 3 '15
Use of slings in handling loads. diags Eng &
Contr 42:338-9 O 7 '14

Sludge. See Sewage sludge

Sludge, Activated. See Sewage aeration

Sluice gates

Inclined seat eliminates sliding friction in new sluice gate. diag Eng Rec 72:214 Ag 14 '15 90-in. circular gate for a 120-ft. head. il diags Eng N 73:865 My 6 '15

Sense of smell in insects. Sci Am S 79:80 Ja 30

Smelter fumes

melter fumes

Effect of sulphur dioxide on human beings.

Eng & Min J 100:885-6 N 27 '15

Metalurgical smoke. C: H. Fulton. bibliog il diags U S Bur Mines Bul 84:1-89 '15; Excepts. Sci Am S 80:310-11 N 13 '15

Progress in the metallurgy of zinc in Great Britain. Eng & Min J 100:469 S 18 '15

Report of the Selby smelter commission. J Ind & Eng Chem 7:41-5 Ja '15; Same cond. Eng & Min J 98:1075-8 D 19 '14

Smelter-smoke litigation in California. Met & Chem Eng 13:206 Ap '15

Solution of smoke, fume and dust problems by electrical precipitation. L. Bradley. Met & Chem Eng 13:911-14 D 1 '15

Treating sulphurous fumes at the Mammoth smelter. A. H. Martin. il Met & Chem Eng 12:769-70 D '14

Vapor pressure of arsenic trioxide. H. V.

Vapor pressure of arsenic trioxide. H. V. Welch and L. H. Duschak, il U S Bur Mines Tech Pa 81:1-20 '15

See also Electric precipitation

Smelteries. See Smelting works

Smelting

melting
Advances in copper smelting. F: Laist. Met
& Chem Eng 13:658 O 1 '15
Advantages of high-lime slags in the smelting of lead ores. S. E. Bretherton. Am Inst
Min E Bul 104:1595-9 Ag '15; Discussion.
108:2479-81 D '15
Blast furnace vs. reverberatory. Eng & Min
J 99:832-3 My 8 '15
Coal-dust fired reverberatory furnaces of Canadian copper co. D: H. Browne. diags Am Inst
Min E Bul 97:49-60 Ja '15; Same cond. Met
& Chem Eng 13:182-4 Mr '15; Abstract. Am
Soc M E J 37:187 Mr '15
Copper Queen smelting works. R: H. Vail. il
Eng & Min J 99:16-6 Ja 2 '15
Copper smelting in Japan. M. Eissler. il diags
Am Inst Min E Bul 95:2661-703 N '14;
Discussion. 101:1173-4 My '15
Copper smelting in the Caucasus. map Eng &
Min J 99:650-3 Ap 10 '15
Definition of smelting. Eng & Min J 100:531
S 25 '15
Development of Sinc smelting in the United
State G: C. Stane. Mat & Chem Eng 13:

Development of zinc smelting in the United States, G: C. Stone, Met & Chem Eng 13: 726-7 O 15 '15

High blast heats in Mesaba practice. W. Mathesius, Am Inst Min E Bul 99:539-55 Mr '15; Same cond. Iron Age 95:475-8 F 25 '15; Same cond. Iron Tr R 56:365-6, 368 F 13 '15: Abstract, Met & Chem Eng 13:177-8 Mr '15: Discussion. Am Inst Min E Bul 101:1100-7

Smelting—Continued High-lime slags in lead smelting; abstract, S. E. Bretherton, Met & Chem Eng 13:766-7 O 15 '15

Improvements at Trail, B. C. Eng & Min J

99:290 F 6

99:290 F 6 '15
Lead smelting at El Paso. H. F. Easter. Am
Inst Min E. Bul 104:1193-1506 Ag '15; Abstract. Met & Chem Eng 13:814 N 1 '15
Metal loss in copper slags. F. E. Lathe. Eng
& Min J 100:215-17, 263-8, 305-8 Ag 7-21 '15
Newnam hearth. W: E. Newnam. il Am Inst
Min E Bul 106:2139-45 O '15; Same. Eng &
Min J 100:628-30 O 16 '15; Excerpts. Met &
Chem Eng 13:974 D 15 '15
Points in the economics of zinc metallurgy.
W. R. Ingalls. Eng & Min J 100:351-4 O 2
'15

Progress in the smelting of Mayari ore. R: V. M'Kay. Iron Age 93:1386-9+ Je 4 '14; Same. Iron Tr R 55:1215-21 D 31 '14
Pyrite smelting. E. D. Peters. Eng & Min J

Iron Tr R 55:1215-21 D 31 '14
Pyrite smelting. E. D. Peters. Eng & Min J
98:1134-5 D 26 '14
Pyritic smelting at Mount Lyell. R. Sticht.
Met & Chem Eng 13:116-18 F '15
Pyritic smelting; discussion. Am Inst Min E
Bul 100:739-61 Ap '15
Reverberatory smelting practice of Nevada
consolidated copper co. Met & Chem Eng
13:681-2 O 1 '15

consolidated copper co. Met & Chem Eng 13:681-2 O 1 '15
Reverberatory smelting practice of Nevada consolidated copper co. R. E. H. Pomeroy. diags plan Am Inst Min E Bul 98:445-53 F '15; Abstract. Met & Chem Eng 13:252-4 Ap

Reverberatory waste-heat boilers. L. Duncan, il diag Eng & Min J 99:152-3 Ja 16 '15 Slag- and matte-granulating devices. P. E. Barbour, diags Eng & Min J 99:239 Ja 30 '15 Smelting at Anyox, B. C. Eng & Min J 100: Start No. 13 15

Smelting at Panulcillo, Chile. il Eng & Min J 100:787-9 N 13 '15 Smelting data of British Columbia copper co. F: K. Brunton. Eng & Min J 100:18-19 J1 3

Smelting methods at Magistral, Durango, Mex. R. W. Bissell. Sch Mines Q 36:22-9 N '14 Use of salt in zinc smelting. Eng & Min J 99:917-18 My 22 '15

\*\*Ree also\*\* Blast furnaces; Furnaces, Metallurgical; Metallurgy; Ore treatment; Slag settlers; Smelter fumes; Smelting works

# Cost

British Columbia copper co. smelter; average daily report for May, 1913. F. K. Brunton. Am Inst Min E Bul 103:1415-17 Jl '15; Excerpt. Met & Chem Eng 13:509 Ag '15 Smelting costs at Greenwood, B. C. Eng & Min J 100:109 Jl 17 '15

Smelting, Electric Electric iron-ore Elec R & W E

melting, Electric
Electric iron-ore smelting in Norway. diags
Elec R & W Elec'n 67.54 Jl 10 '15
Electric smelting for southeastern Alaska.
F. C. Farnham. Eng & Min J 99:287 F 6 '15
Electric smelting for southeastern Alaska.
U. S. Rush. Eng & Min J 98:1149 D 26 '14
Electro-thermic iron-ore smelting in Scandinavia. Eng & Min J 100:351-2 Ag 28 '15
Manufacture of ferro-alloys in the electric furnace. R. M. Keeney. U. S Bur Mines Bul 77:102-85 '14; Excerpts. Iron Tr R 56:717-22+, 765-7+, 862-7+, 972-5 Ap 8-15, 29, My 13 '15

Smelting of copper ores in the electric furnace. D. A. Lyon, diags U S Bur Mines Bul 81:1-76 '15; Excerpt. Sci Am S 80:139 Ag 28

Smelting of metals in the electric furnace. D. A. Lyon and R. M. Keeney. U S Bur Mines Bul 77:72-101 '14

Thermal efficiency of the electric furnace. W. M. Johnson. Eng Soc W Pa 31:488-98; Discussion, 31:499-509 Jl '15

See also Electric furnaces; Electrometallurgy

Smelting works

British Columbia copper co's smelter, Green-wood, B. C. F: K. Brunton. diags Am Inst Min E Bul 103:1401-17 Jl '15

Copper Queen smelting works. R: H. Vail. il Eng & Min J 99:1-6 Ja 2 '15

Copper-smelting works of North America. Eng & Min J 99:54 Ja 9 '15
Cost of cars, electric locomotives, etc., for Arizona copper co.'s new smeltery. diags Eng & Min J 99:495 Mr 13 '15
Cost of conveyors at the Arizona copper co.'s new smeltery. diags Eng & Min J 99:329-30 F 13 '15
Design construction and unit costs of the

P 13 15 Design, construction and unit costs of the power house for the new smelter of the Arizona copper co., ltd., Clifton, Ariz. dlags plans Eng & Contr 42:262-5 S 16 '14 Designing small copper smelting plants. C: C. Christensen. il Eng & Min J 99:225-8 Ja 30

'15
Equipment of Arizona smelters. J. Douglas.
Met & Chem Eng 13:904 D 1 '15
Power plant of the Granby co. T: Wilson. il
plans Power 42:2-7 Jl 6 '15; Abstract. Eng
& Min J 100:113-15 Jl 17 '15; Abstract. Eng
& Min J 100:113-15 Jl 17 '15
Salida smelter. F. D. Weeks. Am Inst Min
E Bul 104:1691-5 Ag '15; Excerpt (Don'ts
in the designing of a smelting works). Eng &
Min J 100:228-9 Ag 7 '15; Excerpt. Met &
Chem Eng 13:814-15 N 1 '15
Smelting works of the Mond nickel co. A. W.
G. Wilson, il diags Eng & Min J 98:1049-51 D

G. Wilson, il diags Eng & Min J 98:1049-51 D

12 '14 Supreme court decides against Ducktown company. Eng & Min J 99:1047 Je 12 '15 Unit construction costs from the new smelter of the Arizona copper co., Itd. E. H. Jones. diags Am Inst Min E Bul 91:1497-1649 JI '14; Abstract. Eng & Contr 42:560-3 D 16 '14 Zinc smeltery at Langeloth. W. R. Ingalls. diags plan Eng & Min J 98:985-9 D 5 '14

See also Metallurgical plants; Smelter fumes

## Safety devices and measures

Accident prevention in smelting works. Eng

Wood on cement brick chimneys. Concrete Cem 5:246-7 D '14

Metallurgical smoke. C: H. Fulton. bibliog il diags U S Bur Mines Bul 84:1-89 '15; Excerpts. Sci Am S 80:310-11 N 13 '15

Ne also Cinders: Fuel; Locomotives—Smoke problem; Mechanical draft; Soot

Smoke helmets

Rescue company no. 1 of the New York fire department. il Sci Am 112:283 Mr 27 '15 Where the smoke helmet would be invaluable: a lesson from the New York subway fire. il Sci Am 112:65 Ja 16 '15

Smoke inspection. See Smoke prevention

Smoke prevention

moke prevention

Economy in use of fuel results in elimination of dense smoke. F. M. Logan. Eng Rec 72: 581-2 N 6 '15

Eliminating smoke, soot and dirt in steam generation. il Textile World 49:565-7 Ag '15

German smoke abatement society. J: B. C. Kershaw. Met & Chem Eng 13:261-3 Ap '15

Headroom for smokeless settings. O. Monnett. Power 40:885-6 D 22 '14

How smokeless combustion is secured by the Boston Edison company. il diag Elec W 66: 469 Ag 28 '15

Mechanical draft and smoke prevention. T: Tait. Dom Eng 73:232 N 20 '15

Metallurgical and special furnaces. O. Monnett. diags Power 41:432-3 Mr 30 '15

Metallurgical smoke. C: H. Fulton. bibliog il diags U S Bur Mines Bul 84:1-89 '15; Excepts. Sci Am S 80:310-11 N 13 '15

Preventing smoke electrically. H. C. Wolf. il Elec W 66:692-3 S 25 '15

Problem of the modern city. W. F. M. Goss. Eng Soc W Pa 31:229-37 Mr '15

Elec W 66:692-3 S 25 '15
Problem of the modern city. W. F. M. Goss.
Eng Soc W Pa 31:229-37 Mr '15
Reconstructing existing plants. O. Monnett.
diags Power 40:920-2 D 29 '14
Record system in a smoke inspector's office.
M. A. Rooney. Power 42:543-4 O 19 '15
Reducing smoke in Pittsburgh. J. W. Henderson. il Power 42:152-3 Ag 3 '15
Return-tubular boiler furnace development.
O. Monnett. diags Power 40:93-4 Jl 21 '14;
Same. Sci Am S 78:394-5 D 19 '14
Smoke abatement in house heating boilers.
M. A. Rooney. il Heat & Ven 12:17-20 O '15

Smoke prevention—Continued
Smoke abatement in Massachusetts, Power 42:
213-14 Ag 10 '15

213-14 Ag 10 '15 Smoke exhauster for the St. Paul engine house at Chicago. W. S. Lacher, il diags Ry Age 58:98-9 Ja 15 '15 Smokeless locomotive operation without spe-cial apparatus. H. H. Maxfield. Ry R 57: 426-9 O 2 '15; Same cond. Ry Age (Mech ed) 89:561-2 N '15; Same cond. Power 42:491-2 O 5 '15

5 '15
Solution of smoke, fume and dust problems by electrical precipitation. L. Bradley. Met & Chem Eng 13:911-14 D 1 '15
Validity of anti-smoke ordinance. A. L. H. Street. Power 42:478 O 5 '15
Washing locomotive smoke. M. D. Franey. diag plan Ry Age 59:558-60 S 24 '15; Same. Ry Age (Mech ed) 89:511-13 O '15; Same. Power 42: 561-3. O 19 '15; Same cond. Eng N 74:966-7 N + '15; Except. Ry R 57:387-8 S 25 '15
Waste-heat boilers. O. Monnett. diags Power 41:196-7 F 9 '15; Same. Eng & Min J 99: 368-9 F 20 '15

See also Electric precipitation; Locomotives Smoke problem

Smoke prevention association 10th annual convention, Cincinnati, Sept. 8-10. Power 42:493 O 5 '15

Smoke recorder

Smoke recorder and monitor. W. W. Strong. il Power 40:912-13 D 29 '14

Smokeless powder

Manufacture of smokeless powder. E: C. Crossman. Sci Am 112:136 F 6 '15

Munitions of the present war. Ry R 57:373-4

Smokestacks. See Chimneys

Smudge pots. See Frost protection

Snag boats
Shallow draft snag boat Swinomish, il plans
Int Marine Eng 20:500-2 N '15

Smag bouts on flood rivers, D. A. Willey, it Sci Am S 79:149 Mr 6 '15

Snakes

Garden of serpents in the Serotherapic insti-tute of Brazil. J. Boyer. il Sci Am 112:447 My 15 '15

Snakes and their value to the agriculturist. R. W. Shufeldt. il Sci Am S 80:344-5 N 27

Snap flasks. See Foundries-Equipment and sup-

Remarkable snowfall of the Sierra Nevada. Sci Am 113:144 Ag 14 '15

See also Snowslides

Snow fences. See Railroads-Snow protection and removal

Snow plows

now plow and life guard combined. C. M. Feist. il Elec Ry J 46:832 O 16'15 Snow

Snow removal

Wethods introduced in New York last winter cut cost and increased speed of snow removal. J: T. Fetherston. il Eng Rec 71: 640-2 My 22 '15

ew York's snow removal plans. il Munic J 37:827-9 D 10 '14

Removal of snow from city streets. Elec Ry J 44:1282 D 12 '14

Report on snow removal work in the city of New York. Good Roads n s 9:254 Je 19'15

Snow plows on motor trucks clear New York streets. il Eng Rec 71:215 F 13 '15 Snow removal. Elec Ry J 44:1248-9 D 5 '14

Snow removal conference held in Philadelphia April 16 and 17, 1914: report of the committee on resolutions; with discussion. Am Soc M E J 37:92-5 F '15; Same. Sci Am S 79:159-60 Mr 6 '15

Snow removal in Montreal, il Elec Ry J 44:1307-8 D 12 '14

Snow removal in New York, il Munic J 38: 805-7 Je 10 '15

Snow-removal plan for New York city, Eng N 72:1310-11 D 31  $\dot{1}4$ 

Snow removal principles: summary of papers and discussions at Philadelphia conference on snow removal. il Munic J 37:830-2 D 10 '14

Sec also Railroads—Snow protection and removal

Snow surveys

Snow survey provides basis for close forecast of watershed's yield. J. E. Church, jr. il Eng Rec 71:494-5 Ap 17 '15

Snowslides

Fatal snowslide at Britannia copper co.'s mines, il Eng & Min J 99:628 Ap 3 '15

Contributions of the chemist to the art of soapmaking M. H. Ittner. J Ind & Eng Chem 7:935-6 N '15

South American market for soap, U.S. Sp. Cons Rep 66:1-16 '15 Tincture of white soap, Sci Am S 79:211 Ap

Social centers John C. Proctor recreation center, Peoria, Illinois. il plans Arch Rec 37:116-31 F '15

Social work

See also Social centers; Welfare work in industry

Societies
Society bookkeeping; standardized method for recording and checking the accounts. Metal Ind n s 12:233-5 Je '15

Societies, Engineering. See Engineering societies

Society for electrical development
Annual meeting, New York, May 11. Elec W
65:1265-6 My 15-15
Work of Society for electrical development,
J. M. Wakeman, Elec W 65:1530 Je 12 '15

Society of automobile engineers
Abstracts of the papers presented on the steamer Noramic. Horseless Age 35:797-806
Je 16 '15

Je 16 '15 Committee reports and papers. Automobile 32: 1057-61, 1088-90, 1103-5 Je 17-24 '15 Mid-west S. A. E. section in Chicago. diags Automobile 33:736-9 O 21 '15 Papers and the discussions at the profes-sional sessions. Horseless Age 35:827-30 Je

23 15 S. A. E. gas-electric committee reports. diags Automobile 32:401-4 Mr 4 '15 S. A. E. winter session produces six new standards. pors Automobile 32:83-6 Ja 14 '15 Winter meeting, New York. Horseless Age 35: 58-74, 110-13 Ja 13-20 '15

## Standards committee

. A. E. standards work under new rules, il Automobile 32:616-17 Ap 8 '15

Society of chemical industry
Annual meeting, Manchester. Engineer 120:91-

Annual meeting, Manchester, July 14-16. Met & Chem Eng 13:543-6 S 1 '15 Meeting of New York section, Nov. 19. Met & Chem Eng 13:921-3 D 1 '15

Society of naval architects and marine engineers 22d annual meeting, Dec. 10-11, 1914. Int Marine Eng 20:8-22 Ja '15 22d general meeting, New York city, Dec. 10-11, 1914. Eng N 72:1231-2 D 17 '14

Society to promote the science of management Labor problems in scientific management. Iron Age 94:1369-72 D 10 '14

Socket appliances. See Electric apparatus and appliances

Soda

Contributions of the chemist to the soda in-dustry. F. R. Hazard. J Ind & Eng Chem 7; 281-2 Ap '15; Abstract. Met & Chem Eng 18:285 My '15

13:285 My '15
Electrolytic cell patents for the production of caustic soda and chlorine, diags Met & Chem Eng 13:815-16 N 1 '15
Feasibility of continuous causticizing, il Met & Chem Eng 13:514-15 Ag '15
Relative value of soda and soda ash, G: B, Morris, Mach 22:61 S '15

Sodium Birth-time of the world: methods of determining its age. J. Joly. Sci Am S 79:77-9 Ja 30 Sodium -- Continued

ordium—Continued Fluoboric and fluosilicic acids in the qualitative analysis of sodium. F. C. Mathers and others. Am Chem Soc J 37:1515-17 Je '15 Sea-salt and geologic time. H. S. Shelton. Sci Am S 79:79-80 Ja 30 '15

Sodium carbonate

odium carbonate
Hydrolysis of sodium carbonate in solution.
F. C. Frary and A. H. Nietz. Am Chem Soc
J 37:2268-73 O '15
Molecular weight of sodium carbonate and the
atomic weight of carbon referred to silver
and bromine, T. W. Richards and C: R.
Hoover. Am Chem Soc J 37:95-107 Ja '15

Sodium chloride. See Salt

Sodium ethylate eactions of sodium ethylate with methyl iodide in absolute ethyl alcohol at 25°. H. C. Robertson, ir. and S. F. Acree. Am Chem Soc J 37:1902-9 Ag '15 Reactions of

Reinterpretation of the reactions of sodium methylate and sodium ethylate with 1, 2-dinitrobenzene and 1, 2, 4-dinitrochlorobenz zene, and 1, 2, 4-dinitrobromobenzene. S. F. Acree. Am Chem Soc J 37:1909-14 Ag '15

Sodium formate

ate of reduction of mercuric chloride by sodium formate. G. A. Linhart. Am Chem Soc J 37:70-6 Ja '15

Sodium hydrazide

Anhydrous hydrazine; electrolysis of a solu-tion of sodium hydrazide in anhydrous hydrazine. T. W. B. Welsh. diag Am Chem Soc J 37:497-508 Mr '15

Sodium hydroxide

Hydrogen potentials of sodium hydroxide solu-tions and the dissociation constant of water. F. C. Frary and A. H. Nietz. Am Chem Soc J 37:2263-8 O '15

Sodium malonic ester

Study of the reactions of sodium malonic ester. C. L. Jackson and F. C. Whitmore. Am Chem Soc J 37:1522-37, 1915-34 Je, Ag '15

Sodium methylate

Reinterpretation of the reactions of sodium methylate and sodium ethylate with 1, 2-dinitrobenzene, and 1, 2, 4-dinitrochloroben-zene and 1, 2, 4-dinitrobromobenzene. S. F. Acree. Am Chem Soc J 37:1909-14 Ag '15

Sodium nitrate. See Saltpeter, Chile

Sodium phthalate

Acid potassium and acid sodium phthalates as standards in acidimetry and alkalimetry. W. S. Hendrixson. Am Chem Soc J 37:2352-9

Sodium salts

Use of sodium salts in the purification of clays and in the casting process. A. V. Bleininger. il diags U S Bur Stand Tech Pa 51:1-40 '15

Sodium silicate

Silicate of soda in dyeing cotton. A. Bolis. Textile World 49:117-19 Ap '15

Sodium sulphate

Molecular weight of sodium sulfate and the atomic weight of sulfur, T. W: Richards and C: R. Hoover. Am Chem Soc J 37:108-13 Ja '15

Cabinet work for the carpenter, P. D. Otter. diags Bldg Age 37:49-50 N '15

Soil analysis

Amino-acid nitrogen of soil and the chemical groups of amino acids in the hydrolyzed soil and their humic acids. R. S. Potter and R. S. Snyder. Am Chem Soc J 37:2219-27 R. S. S '15

Colorimetric determination of phosphorus in soil extracts. C. E. Millar and F. A. Gang-ler. J Ind & Eng Chem 7:619 Jl '15

Comparison of silicates and carbonates as sources of lime and magnesia for plants. W. H. MacIntire and L. G. Willis. il J Ind & Eng Chem 6:1005-8 D '14

Determination of ammonia in soils, R. S. Potter and R. S. Snyder, il Ind & Eng Chem 7:221-6 Mr '15

Determination of nitrates in soil. R. S. Potter and R. S. Snyder. J Ind & Eng Chem 7:863-4 O'15

Determination of nitric nitrogen in soils. E. R. Allen. diags J Ind & Eng Chem 7:521-9 Je '15

Determination of soil carbonates; a modification. W. H. MacIntire and L. G. Willis, il J Ind & Eng Chem 7:227-8 Mr '15
Determination of sulfates in soils. P. E. Brown and E. H. Kellogg. J Ind & Eng Chem 7:686-7 Ag '15

7 Åg '15

Effect of grinding the soil on its reaction as determined by the Veitch method. P. E. Brown and H. W. Johnson, J Ind & Eng Chem 7:776-7 S '15

Method for the determination of the immediate lime requirements of soils. W. H. MacIntire. il J Ind & Eng Chem 7:864-7 O '15

Modified kjeldahl flask for determining soil nitrogen. H. A. Noyes. il Am Chem Soc J 36:2541-2 D '14

Presence of proteoses and peptones in soils.

Presence of proteoses and peptones in soils. E. H. Walters: J Ind & Eng Chem 7:860-3 E. H. O '15

Shaker for the mechanical analysis of soils. F. Ward. J Ind & Eng Chem 6:1038 D '14 Strength of nitric acid, period of extraction, and ignition as affecting the gravimetric determination of phosphoric acid in soils. O. L. Brauer. J Ind & Eng Chem 6:1004-5 D '14

Soil bacteriology
Tillage of the soil by minute living organisms. Sci Am S 80:142 Ag 28 '15

Soil millers

Milling the soil; improving on the old-fash-ioned plow. L. W. Ellis. il Sci Am 112:436 My 8 '15

Soil moisture

Determining the critical moisture content of soils. R. O. E. Davis. J Ind & Eng Chem 6: 1008-10 D '14

See also Drainage

Soil pressure. See Earth pressure

Soil testing Specifications for uniform screens for soil tests. Eng N 73:267 F 11 '15

Cleaning soils for microscopic examination, W. H. Fry and J. A. Cullen. J Ind & Eng Chem 7:40-1 Ja '15 Comparison of silicates and carbonates as sources of lime and magnesia for plants.

Comparison of silicates and carbonates as sources of lime and magnesia for plants. W. H. MacIntire and L. G. Willis. il J Ind & Eng Chem 6:1005-8 D '14
Engineering properties of soils. R. O. E. Davis. J Ind & Eng Chem 7:422-5 My '15
Lithium in soils. L. A. Steinkoenig. J Ind & Eng Chem 7:425-6 My '15
Loss of nitrogen and organic matter in cultivated Kansas soils and the effect of this loss on the crop-producing power of the soil. C. O. Swanson. J Ind & Eng Chem 7:529-32
Je '15

See also Alkali soils; Clay; Drainage; Fertilizers and manures; Foundation soils; Irrigation; Soil analysis; Soil bacteriology; rigation; Soil moisture

Soils, Foundation, See Foundation soils Solar electricity. See Electricity, Solar Solar heat. See Sun

Solar heaters

Inexpensive solar heating plants. Metal Work 82:758 D 11 '14

Solar magnetism. See Magnetism, Solar

Solar power plants
Shuman-Boys sun-power plant at Meadi,
Egypt. Eng & Min J 100:156 Jl 24 '15
Utilization of solar energy; abstract. A. S. E.
Ackermann. Am Soc M E J 37:661 N '15

ew evidence on the intensity of radiation outside the atmosphere. C. G. Abbot, F. E. Fowle and L. B. Aldrich. Sci Am S 80:258-9 O 23 '15 Solar radiation

Solder and soldering
Aluminum solder. Elec R & W Elec'n 67:670-1

Convenient electric soldering iron. J. N. Gra-ham. diag Elec Ry J 46:66 Jl 10 '15

Gas furnace for heating soldering irons. R. H. Parsons. plan Elec Ry J 46:24 Jl 3 '15

Solder and soldering—Continued
Micro reactions of soldering. J. Scott, il Dom
Eng 73:103-4 O 23 '15
Monarch electric soldering iron. il Elec R &
W Elec'n 67:635 O 2 '15
Soldering and brazing aluminum. Mach 21:286-

8 D '14 Soldering commutators and rotors, G. Fox, diags Power 42:328-9 S 7 '15 Various constructions of charcoal fire pots, diags Metal Work 84:649-51 N 19 '15 Working aluminum at 400 degrees fahrenheit, il Horseless Age 36:373 O 15 '15

See also Welding

Solenoid brake. See Brakes

Solenoids

Solenoid and electromagnet windings. G: L. Hedges. Am Inst E E Pro 34:2595-614 N '15

Solidago

Volatile oils of the genus solidago. E. R. Miller and M. H. Eskew. Am Chem Soc J 36: 2538-41 D'14

Soluble ferments. See Enzymes

Soluble ferments. See Enzymes

Solution (chemistry)

Absorption and the surface tensions of aqueous solution of homologous fatty acids and alcohols. M. Neidle. Am Chem Soc J 37: 513-15 Mr '15

Anhydrous hydrazine as a solvent. T. W. B. Welsh and H. J. Broderson. diags Am Chem Soc J 37:816-24 Ap '15

Conductivity and viscosity of solutions of electrolytes in formamid. P. B. Davis, W. S. Putnam and H. C. Jones. il diags J Fr Inst I80:567-601 N '15

Determination of the solubility of silver nitrite

Determination of the solubility of silver nitrite

Determination of the solubility of silver nitrite and its degree of dissociation in a saturated solution. H: J. M. Creighton and W: H. Ward. Am Chem Soc J 37:2333-8 O'15
Distribution of an electrolyte between water and some second solvent and its dissociation constant in aqueous solution. H: J. M. Creighton. J Fr Inst 180:63-74 J1'15
Effect upon their solution tensions of dissolving the alkali and alkali earth metals in mercury, and the constitution of such solutions. G: M. Smith Am Chem Soc J 37:76-80 Ja'15
Entropy of vaporization as a means of distinguishing normal liquids. J. H. Hildebrand. Am Chem Soc J 37:979-8 My'15
Hydrogen- and hydroxyl-ion activities of solutions of hydrochloric acid, sodium and potassium hydroxides in the presence of neutral salts. H. S. Harned. diag Am Chem Soc J 37:2460-82 N'15
Hydrogen potentials of sodium hydroxide solu-

37:2460-82 N '15

Hydrogen potentials of sodium hydroxide solutions and the dissociation constant of water.

F. C. Frary and A. H. Nietz. Am Chem Soc J 37:2263-8 O '15

Ionic hydration and transference numbers of caesium chloride. E: W. Washburn and E. B. Millard. Am Chem Soc J 37:694-9 Ap '15

Measurement of vapor pressure lowering by the air saturation method. E: W. Washburn and E: O. Heuse. il diags Am Chem Soc J 37: 309-21 F '15

Method for the calculation of the hydration of the ions at infinite dilution, and the ideal diffusion coefficient as applied to the hydrodiffusion of electrolytes. G: M. Smith. Am Chem Soc J 37:722-33 Ap '15

Relative solubility of certain silver salts. A. E. Hill. Am Chem Soc J 37:510-13 Mr '15

Solubility curves of salt hydrates: calcium nitrate. H. S. Taylor and W: N. Henderson. Am Chem Soc J 37:1688-94 Jl '15

Solubility of certain difficultly soluble silver salts. A. Thiel. Am Chem Soc J 37:508-10

Mr '15

Solubility of magnesium carbonate in natural

Solubility of magnesium carbonate in natural waters, R. C. Wells. Am Chem Soc J 37:1704-7 JI '15

Solubility of mixtures of sodium and potassium chlorides in solutions of hydrochloric acid. W. B. Hicks. diag Am Chem Soc J 37: 844-7 Ap '15

Studies of the vapor pressure of solutions; a static method for the determination of the difference between the vapor pressure of solution and that of solvent. J. C. W. Frazer and B. F: Lovelace. diags Am Chem Soc J 36:2439-49 D '14

Vapor pressures of certain alcoholic solutions, O. F. Tower and A. F. O. Germann, il Am Chem Soc J 36:2449-56 D '14

What is a normal solution? D. M. Liddell. Power 42:448 S 28 '15

See also Boiling points; Colloids; Concentration cells; Electrolysis; Electrolytes; Os-

Solutions, Alkalimetric. See Alkalimetric solu-

Constitution of the iron-carbon alloys: a chemical theory to explain the different properties by the existence of ferrated carbides. G: Auchy. Iron Age 95:50-1 Ja 7 '15 Heat of formation of solid solutions. H. W. Foote and B. Saxton. Am Chem Soc J 36: 1704-8 Ag '14

Solutions, Standardized. See Volumetric analysis

Solutions, Supersaturated
Rhythmical precipitation of ferrous ferricyanide and ferrous hydroxide in jelly. H: J. M. Creighton. il Am Chem Soc J 36:2357-60 N

cot
Results with mechanical soot blowers on boilers. A. J. Fisher. Power 42:314 Ag 31 '15
Schutte & Koerting soot conveyor. diag Power
41:876 Je 29 '15
Soot blowers as adapted for use on economizers. diag Power 42:194-5 Ag 10 '15
Soot removal. H. R. Blessing; J. Priefer.
Power 41:615-16 My 4 '15
Tests of hand and mechanical soot blowers.
A. W. Conklin. diag Power 42:48-50 Jl 13
'15

Vulcan vertical water-tube boiler cleaner. diags Power 42:223 Ag 17 '15

Instance of the parabolic reflector reversed; Galveston sea wall as a sound reflector, L. F. J. Zerbee, Sci Am 113:235 S 11 '15 Zones of silence, W. J. L. Kiehl, Sci Am 112:

360 Ap 17 '15

See also Acoustics, Architectural; Noise; Phonetics; Radiation

Sound wheel, a novel wireless detector. il Sci Am 112:384 Ap 24 '15

Sounding

R & W Elec'n 66:1002-3 My 29 '15; Abstract. Eng M 49:764 Ag '15

Soup kitchens World's largest soup kitchen. Sci Am 112:329 Ap 3 '15

South

Industries and resources

Industrial resources and opportunities of the South. A. D. Little. J Ind & Eng Chem 7:373-9 My '15; Same cond. Met & Chem Eng 13:281-2 My '15
Iron, steel and coal in Dixie. H. S. Chamberlain. Iron Tr R 56:176-8+ Ja 21 '15

South Africa

Commerce

American pipe and fittings in South Africa. Iron Age 96:1230-1 N 25 '15

South America

South America as a field for American engineers. B. Willis. Eng Rec 70:620 D 5 '14 See also Latin America

Commerce

Careful and intelligent cultivation necessary for extension of our commerce. C. Townley. Elec W 65:1136-7 My 1 '15
Commercial opportunities in Latin-America. E. H. Darville. il Metal Work 83:553-6 Ap 9 '15

Consular recommendations on South American trade. U S Bur For & Dom Com misc ser 20:1-29 '15
Electrical markets in Brazil. H. N. Douthitt.
Elec W 65:1488-9, 1598 Je 5, 19 '15

How to sell to Latin-America. A. Del Mar. il Eng M 50:341-56 D '15

Machinery trade with South America. J. A. Massel. Iron Age 96:1128-9 N 11 '15

South America-Commerce-Continued

South America Commerce—Continued
South American business and America's opportunity. W: T. Taylor. Elec W 65:205 Ja 23 '15
South American market for jewelry and silverware. U S Sp Cons Rep 70:1-23 '15
South American market for soap. U S Sp
Cons Rep 66:1-16 '15

South American markets for machine tools. B. O. Hough. Mach 21:545-6 Mr '15 South American trade conditions. R. G. Betts. Mach 21:502 F '15

Trade opportunities in South America. Elec W

61:1172-3 1) 12 '14 West coast business. M. R. Lamb. il Eng & Min J 99:433-7 Mr 6 '15

### Industries and resources

Coal fields of South America. W. G. Burroughs. map Colliery 35:552-3, 643-4; 36:30-1, 153-5 My, Jl-Ag, O '15 Fuel conditions in South America. J. W. Hardy. Ry Age 58:1056-7 My 21 '15 South America in 1914; mining industry. maps Eng & Min J 99:125-30 Ja 9 '15

### South Dakota

Sec also Mines and mineral resources— South Dakota

South Orange, New Jersey

### Water supply

esign features of the new water works at South Orange, N. J. il Eng & Contr 43:519-

# Southampton, Long Island

### Parrish museum

Parrish museum, Southampton, Long Island. C: C. May. il plans Arch Rec 38:524-39 N '18

Southern California Edison company Annual report, 1914. Elec W 65:1032 Ap 24 '15

Annual report, 1914. Elec W 65;1032 Ap 24 '15
Southern Pacific railroad
Contact system of the Southern Pacific company Portland division. P. Lebenbaum. il
diags map Am Inst E E Pro 34:1295-1308 Je
'15; Abstract. Elec Ry J 46:57-8 Jl 10 '15
How a railway helps the farmer to produce
bigger and better crops. H. A. Hinshaw.
Elec Ry J 46:559 S 18 '15
Mr. Kruttschnitt testifies in dissolution suit.
Ry R 56:834-5 Mr 13 '15

Railroad built around burning tunnel in three weeks. il Eng Rec 71:797 Je 26 '15

Thirty-first annual report, map Ry Age 59: 789-90, 839-42 O 29 '15

Southern railway company New terminal for the Southern at Birming-ham, Ala. il diags Ry Age 59:743-6 O 22 '14

Twenty-first annual report, map Ry Age 59: 722-4, 781-4 O 22 '15

Southern textile association

Meeting at Greenville, S. C. Textile World 50:157-65 N '15

Southwark-Harris oil engine. See Diesel engines

Southwest

Resources and possibilities of chemical industry in the Southwest. E. Baruch, Met & Chem Eng 13:604-8 S 15 '15

Southwestern electrical and gas association 11th annual convention, Galveston, Tex., May 19-22. Am Gas Light J 102:375, 378-9 Je 14

11th annual convention, Galveston, Tex., May 19-22. Elec Ry J 45:1025-30 My 29 '15

11th annual convention, Galveston, Tex., May 19-22. Elec R & W Elec'n 66:996-8 My 29

11th annual convention, Galveston, Tex., May 19-22. Elec W 65:1435-7 My 29 '15

Sov beans

Carbohydrates and the enzymes of the soy bean, J. P. Street and E. M. Bailey, J Ind & Eng Chem 7:853-8 O '15

Studies on enzyme action: the lipase of soy beans, K. G: Falk, Am Chem Soc J 37:649-53 Mr '15

Spacing tables

Spacing table in the structural shop: equipment in Fort Pitt bridge works. G: P. Thomas. il Iron Age 95:139-41 Ja 14 '15

### Snain

### Industries and resources

Spanish potash deposits. Eng & Min J 100: 262 Ag 14 '15

### Navv

First Spanish submarine. Sci Am S 80:229 O

Spanish America, See Latin America,

Spark plugs

Electrical lectrical equipment of automobiles. P. M. Heldt. diags Horseless Age 34:918-20 D 23

Spark-plug ignition systems, A. H. Israel, diags l'ower 41:258-60 F 23 '15
Testing plant for spark plugs, il Automobile 31:1075 D 10 '14

Specific gravity

pecific gravity
Formulas for specific gravity, etc., of alloys.
W. L. Tryon. Foundry 43:222a Je '15
Pulp constants, with tables to facilitate tonnage
calculations for pulps of all usual solution
and dry slimes specific gravities. G. H.
Clevenger, H. W. Young and T. N. Turner.
Eng & Min J 98:1079-94 D 19 '14
Specific gravity—its determination for tars,
oils and pitches. J: M. Weiss. il J Ind & Eng
Chem 7:21-4 Ja '15

See also Hydrometers

Specific heat

Absolute zero. S. Dushman. Gen Elec R 18: 239-43 Ap '15
Specific heat and heat of fusion of ice. H. C. Dickinson and N. S. Osborne. diags U S Bur Stand Bul 12:49-81 O 28 '15; Abstracts. J Fr Inst 179:489-91 Ap '15; Power 41:565 Ap 27 '15; Am Soc M E J 37:294-5 My '15
Specific heat of copper in the interval 0° to 50° C. D. R. Harper, il U S Bur Stand Bul 11:259-318 Mr 1 '15
Specific heat of superheated steam at pressures from 8 to 20 atmospheres, and from temperature of saturation to 380 deg. cent.; abstract. O. Knoblauch and A. Winkhaus. Am Soc M E J 37:409-10 Jl '15

Specifications

Alternate specifications for public work are legal. D. T. Pierce. Eng N 74:1048-50 N 25

Elements of specifications. M. B. Smith. Power 42:770-3 N 30 '15

Fifty-three standards considered by American society for testing materials, Iron Tr R 57:37-48 Jl 1 '15

Relation of tests and specifications to the uses of materials. B: Brooks, Munic J 39: 810-11 N 25 '15

Specification fiends. Eng Rec 70:677-8 D 19 '14 Writing specifications, D. S. Kimball, Power 42:266-7 Ag 24 '15

Sce also Standards, Engineering; also sub-division Specifications under names of sub-jects, e. g. Bridges—Specifications; Coal— Specifications; Rails—Specifications; Steel— Specifications

Spectacles
Glasses for protecting the eyes from infra-red rays, W. W. Coblentz. J Fr Inst 179: 579-80 My '15

Report on colored glasses for eye protection. F: W. King. Iron Tr R 56:727 Ap 8 '15

Shooting spectacles, Dr. Schanz, Sci Am 112: 629 Je 26 '15 '15

See also Goggles

Spectrometers

X-ray spectrometer for the study of the prop-erties of crystals. diag Sci Am S 79:19 Ja 9 '15

Spectrum

Controlling infra-red emission. W. W. Coblentz. Elec W 66:1155-6 N 20 '15

See also Infra-red rays; Radioactivity;
Ultra-violet rays

Spectrum analysis

the iron spectrum (2851-3701). K. Burns and W. F. Meggers. U S Bur Stand Bul 12: 179-205 N 8 '15; Abstract. J Fr Inst 180:375-6

Speech

See also Phonetics

Speed shifter

Speed shifter of new type, il Iron Tr R 57:272 Ag 5 '15

Ag 5 '15
Speed variation
New type of speed changing gear, il Iron Age
'96:214 Jl 29 '15
Quick speed changes in new drill press, il
Automobile 32:422 Mr 4 '15
Records of speed variation, F. B. Steele, il
Elec W 65:1687-8 Je 26 '15
Solution of speed reduction, diag Mach 21:
746-7 My '15
Turbine speed reduction gear, il diags Engineer 120:315-16 O 1 '15

neer 120:315-16 O 1 '15 Turbo-reduction gear, il diag Power 41:887 Je

Speedometers

Speedometers and other indicating instruments at the show. H. H. Brown. Il Horseless Age 35:22-3 Ja 6 '15 Van Sicklen uses air principle. il Automobile 33:287 Ag 12 '15

Speedways

peedways
Adapting an old racetrack to automobile racing, il Eng N 74:60:14 S 23 '15
America's first concrete speedway, Minneapolis, diag Automobile 33:434 S 2 '15
Building a two-mile speedway in six weeks, il diag Eng Rec 71:686-7 My 29 '15; Abstract (Wood-floor speedway). Eng M 49:934 S '15
Building Twin City concrete automobile racetrack, il diag Eng N 74:806-8 O 21 '15
Concrete-paved automobile racetrack, St. Paul, Minn. Eng N 74:233 Jl 29 '15
Diagrammatic plan of the Sheepshead Bay speedway. Horseless Age 36:243 S 1 '15
Motor race-track at Chicago, il diags plan Eng N 74:188-91 S 9 '15
New York speedway, il map Automobile 32: 664-5 Ap 15 '15
Rush construction at Sheepshead Bay, il Auto-

Rush construction at Sheepshead Bay. il Auto-mobile 32:1067 Je 17 '15

Sheepshead Bay motor racetrack, il diags Eng N 74:337-40 Ag 19 '15

Sheepshead Bay speedway officially announced. il Horseless Age 35:487-8 Ap 14 '15

Sheepshead Bay two-mile speedway scientifi-cally designed for high velocities, il diags Eng Rec 71:739-40 Je 12 '15

Test automobiles in Detroit on artificial hill. il Eng Rec 72:350 S 18 '15

\$250,000 speedway for Louisville. Automobile 33:354-5 Ag 19 '15

2-mile board speedway for Chicago. plan Auto-mobile 31:1137 D 17 '14

Spelling

Orthography in geography and biography. F. H. Teall. Inland Ptr 54:485-7 Ja '15

Simplified spelling in business. Munic Eng 49:66 Ag '15

Value of rules for spelling. F. H. Teall. Inland Ptr 55:190-1 My '15

See also Compound words

Spelter. See Zinc

Spencer, Herbert, 1820-1903 Herbert Spencer, engineer. E. E. Thum. Eng N 73:802-4 Ap 29 '15

perry, Elmer Ambrose, 1860-Sketch, por Eng M 50:212-13 N '15

Marine wood borers: little known crustaceans of destructive habits. C. H. Truesdale, il Sci Am S 78:356-7 D 5 '14

Sphere gap
Sphere gap as a means of measuring high
voltage. F. W. Peek, jr. Am Inst E E Pro
33:889-914 Je '14; Discussion. 34:103-24 Ja '15

Sphere gap discharge voltages at high frequencies. J. C. Clark and H. J. Ryan. il Am Inst E E Pro 33:937-51 Je '14; Abstract and discussion. Elec R & W Elec'n 65:28-9 Jl 4 '14; Discussion. Am Inst E E Pro 34: 103-24, 452-4 Ja, Mr '15

Spiders

Spinning of a web. F. Cuttriss. il Sci Am S 79:136-7 F 27 '15

Spiegeleisen

peration of spiegeleisen blast furnaces. H. Thaler. Iron Age 94:1398-9 D 17'14

Spikes (railroad)

pikes (railroad)

Results with nve years' use of screw spikes on the D. L. & W. R. R. G. J. Ray, il Ry R 56:424-30 Mr 27 '15; Same cond. Ry Age 58:839-42 Ap 16 '15; Same cond. Eng & Contr 43:450-2 My 19 '15; Excerpts. Eng Rec 71: 430-1 Ap 3 '15; Abstract. Eng M 49:276-9 My '15; Summary. Eng N 73:690-1 Ap 8 '15 Screw spikes. Ry Age 58:833-4 Ap 16 '15

Spillways

Run-off formulas for small spillways com-pared. F. M. Aguirre. Eng Rec 72:640 N 20

Siphon spillway for power dam, T. K. Mathewson, diag Eng N 74:269 Ag 5 '15

Spindles

Oilless spindle. diags Textile World 50:198-9 N

Spinning

Spinning fine yarn, Textile World 48:389-91 Ja

Nec also Cotton spinning; Textile industry and fabrics; Yarn

Spinning machinery

Improved thread guide. il Textile World 49: 331-2 Je '15

Roving clamp for spinning machines, diag Textile World 48:353 D '14
Tension regulator for spinning machines, if Textile World 49:525-6 Ag '15

Thread board for spinning machines, diag plan Textile World 48:593-4 F '15 Wet spinning machine, diag Textile World 49:128 Ap '15

Spires

Church towers, steeples, and spires of Sir Christopher Wren, R. R. Phillips, il Brickb 24:228-32 S '15

Spitzbergen

retic coal; preliminary success of American interests in Spitzbergen. M. R. Berr. Eng M 49:760-1 Ag '15 oal mining in Spitzbergen. Eng & Min J 100:672-3 O 23 '15

Splice bars. See Rail joints Splicers. See Electric cables: Trolley wire splicers

Spokane, Washington

Railroads

t. Paul and Oregon-Washington joint terminals in Spokane. il plans Ry Age 58:85**-8 Ja** 15 '15

Spokane terminal improvement involved variety of engineering construction. il plan Eng Rec 71:234-6 F 20 '15

Sponge iron

Searching experiments on the Ajo ores. S. Croasdale. Am Inst Min E Bul 92:1919-24 Ag '14; Excerpt (Manufacture of sponge iron as a precipitant for copper). Eng & Min J 99:326-8 F 13 '15 Leaching

Sponging and shrinking machine

Sponging and shrinking machine, diags Textile World 48:426-7 Ja '15

Spontaneous combustion
Absorption of oxygen by coal. W. F. Winmill.
Colliery 36:147-52 O '15
Land storage of bituminous coal; the ever
present factor of spontaneous combustion;
abstract. G: R. Crapo. Am Soc M E J 37;
612 O '15

Spoolers

Saco-Lowell spooler. il Textile World 49:689-91 S'15

Making patterns for cone hopper and spout. diags Metal Work 84:112-13 Jl 23 '15 Patterns for intersecting conical spouts. diags Metal Work 83:627-9 Ap 30 '15

Sprague, Frank Julian, 1857-Sketch. por Eng M 50:206-7 N '15

Spreader cars, See Cars (spreader)

Spring banding machine Design. Ry Age (Mech ed) 89:478 S '15

Spring rigging. See Locomotives-Spring rigging

### Springfield, Massachusetts

### Public buildings

Public comfort station now under construction, at a cost of twenty-four thousand dollars. H. L. Sprague. il plan Munic J 38:218-19 F 18 '15

## Water supply

Springfield water-works, il Eng N 74:406-9, 443-5 Ag 26-S 2 '15

## Springfield, Ohio

### Politics and government

Commission and city manager forms of government. H. H. Rumble, R. W. Peatross and J: E. Burke. Munic Eng 49:55-6 Ag '15

## Springs

Using sing volcanic steam for the production of electrical energy, il Sci Am 112:97-8 Ja 30 15

### See also Mineral waters

See also Mineral Waters

Springs (mechanism)

Automatic spring forming machine, il Iron
Age 96:929 O 21 '15

Characteristics of plate springs. G: S. Chiles.
il Ry Age (Mech ed) 89:161-3, 219-22, 340-3,
392-5 Ap-My, JI-Ag '15

Design of steel passenger equipment. V: W.
Zilen. Ry Age (Mech ed) 89:515-16 O '15

Helical springs for street cars. Elec Ry J 46:
409-10 S 4 '15

Master blacksmiths' convention: discussion of

Master blacksmiths' convention; discussion of

master diacosmiths' convention; discussion of spring making and repairing, il Ry Age (Mech ed) 89:474-5 S '15
Partial and total deflections of leaf springs en masse. D: Landau and A. Golden. Horseless Age 35:104-7, 153-4, 447-9 Ja 20-27, Mr 31 '15

31 '15 Science in spring manufacture. A. L. Clayden. il Automobile 32:835-40 My 13 '15 Spring forming and hardening machine. il Iron Age 95:1164-5 My 27 '15 Universal elliptic spring forming machine. diags Ry Age (Mech ed) 89:593 N '15 Wire springs. E. R. Morrison. diags Mach 21: 558-60 Mr. '15

See also Automobiles—Springs; Locomotives—Springs; Watch springs

Springs, Automobile. See Automobiles-Springs

### Sprinkler systems

Combined heating and sprinkler system for a factory building; Wheelock, Lovejoy & co., Cambridge, Mass. C: L. Hubbard. il plans Heat & Ven 12:13-17 O '15

### Sprinklers

Fire protection for the factory, il Ind Eng 15: 90-4 S '15

Manufacture of ethyl alcohol from wood waste; the hydrolysis of white spruce. F. W. Kress-mann. J Ind & Eng Chem 7:920-2 N '15

Square (instrument)
Roof framing with the steel square, D. P.
Barry. Bldg Age 37:45-6 O '15
Roof framing with the steel square, il Bldg
Age 37:45-6 N '15

Story of the combination square, L. S. Starrett, Mach 21:360 Ja '15

Testing a square. G. A. Remacle, diag Mach 22:61-2 S  $^{\prime}15$ 

### Stables

Concrete floors for stables, L. C. Wason, Concrete Cem 6:42-3 Ja '15

Construction of sanitary mangers in dairy barn at Troy, Pa. il diags Concrete Cem 6: 104-6 F '15

Frame barn of a northwestern farmer, il plan Bldg Age 37:25-6 Ap '15

Heating and ventilating stables and garages. C: L. Hubbard, diags Dom Eng 72:168-70 Ag

Round dairy barn of hollow tile. W. E. Frudden. il plans Bldg Age 37:27-8 Je '15

Sheet metal in farm buildings diags plan Metal Work 83:181-2+ Ja 29 '15 Ventilation of dairy barns. J: L. Shawyer, Bldg Age 37:62 N '15

Stacks. See Chimneys

Stadia

Design and construction features of the Palmer memorial stadium, Princeton, N. J. il diags plan Eng & Contr 43:472-5 My 26 '15 Palmer memorial stadium at Princeton uni-versity, il diags plan Eng N 72:1184-7 D 10

San Diego's municipal stadium. F. A. Rhodes. il plan Eng N 74:577-80 S 23 '15

Stadia measurements

tadia measurements
Account of micrometers for measuring distances. J. Watt. Eng N 73:471 Mr 11 '15
Examples of stadia surveying and its broader uses with special reference to preliminary hydraulic surveys. W. B. Saunders. Eng & Contr 43:570-2 Je 30 '15
Long stadia sights. Eng N 73:990-1 My 20 '15

Stadiagraph

Averill stadiagraph, diag Eng M 49:sup4 Ap

## Staff system. See Railroads-Signals

Stage lighting
Mobile color and stage lighting. B. Jones. il
plan Elec W 66:245-9, 294-7, 346-9, 407-9, 4546 Jl 31-Ag 28 '15

# Staging. See Scaffolding

Stairs. See Stairways

# Stairways

Cleveland bases stairway regulations on studies. Eng Rec 72:260 Ag 28 '15

Construction of a platform stairway, diags Bldg Age 37:33-5 Ja '15

Disappearing stairway. C: A. Byers. il Bldg Age 37:53-4 Jl '15

Modern schoolhouse. W. H. Kilham, il plans Brickb 24:39-42 F '15

Stairways in houses of moderate cost. J: T. Fallon. il plans Brickb 24:111-14, 159-63, 193-6 My, Jl-Ag '15 See also Railings

## Stairways, Concrete

Architectural effects secured in Glens Falls arch bridge over Hudson river, il diags Eng Rec 72:574-6 N 6 '15

Building reinforced-concrete steps without forms. R. C. Hardman. diag Eng N 73:731 Ap 15 '15

# Stairways, Moving. See Moving stairways

Stamp mills

Tamproved form of cam for stamp mills. A. B. Foote. diag Am Inst Min E Bul 96:2765-6 D '14; Same. Eng & Min J 98:1046 D 12 '14 Notes on Homestake metallurgy; stamp milling; analysis of lost time; cost. A. J. Clark. il Am Inst Min E Bul 103:1382-7 Jl '15

Stamp milling in 1914. H. A. Megraw. Eng & Min J 99:97-8 Ja 9 '15

See also Crushing machinery; Gold milling; Metallurgy; Ore treatment

Standard documents. W: S. Parker. Am Inst
Arch J 3:300-3, 346-51, 388-92 Jl-S '15

Standards. See Units

Standards, Bureau of. See United States—Standards, Bureau of

Standards, Electric. See Electric standards

Standards, Engineering
Engineering standards committee annumeeting. Engineer 120:116, 118 Jl 30 '15

Fifty-three standards considered by American society for testing materials. Iron Tr R 57: 37-48 J1 1 '15

1915 U. S. standard schedule of flanged fittings and flanges. Eng & Min J 99:1121 Je 26 '15; Same. Power 41:782 Je 8 '15

Relation of standards to the development of engineering. W. S. Stratton. Am Soc M E J 37:38-40 Ja '15

Results of factory standardization. C. B. Auel. il diags Iron Tr R 57:125-30 Jl 15 '15; Abstracts. Iron Age 94:1280-2 D 3 '14; Ind Eng 14:458-60 D '14; Am Soc M E J 37:13-15 Ja '15; Discussion. 37:15-16 Ja '15

See also Electric standards; also subdivision Standards under names of subjects, e. g. Automobiles—Standards; Gas—Standards; Metallurgy—Standards; Railroads—Standards

Coating of standpipes at Reading, Mass., and Bultimore, Md. F. C. Perkins, il Eng & Contr 44:32 Jl 14 '15

Design and construction of the new standpipe of the Youngstown, Ohio, water works, N. E. Hawkins. il diag Eng & Contr 43:237-8 Mr 17 '15

Fire prevention. E: R. Hardy. Arch & Bldg 47:28-9 Ja '15

Grouting or cushioning stand pipe bases; abstracts, C: W. Sherman, Munic J 39:812 N 25 '15; Eng & Contr 44:410-11 N 24 '15

Mercury column alarm for standpipes successfully employed at Ripon, Wis. W. E. Haseltine. diag Eng & Contr 43:550-1 Je 23 '15 See also Surge tanks; Water towers

Standpipes, Concrete
Concrete standpipes; information concerning
more than forty erected in the United States.
il Munic J 39:107-10 Jl 22 '15

Design, construction and cost of reinforced concrete standpipes. W. G. Kirchoffer. il Eng & Contr 43:331-3 Ap 14 '15

Design, construction and durability of reinforced concrete standpipes. H. B. Andrews and others. Eng & Contr 44:47-9 Jl 21 '15

Design features and cost of gravity water works at Mellen, Wis. W. G. Kirchoffer. il diags Eng & Contr 44:159-60 S 1 '15

esign of reinforced-concrete standpipes. H. W. Alrich; L. C. Wason, il Eng N 73: 949-50 My 13 '15

Discussion of reinforced-concrete standpipes. Eng N 73:554-5 Mr 18 '15 History of Attleboro, Mass., standpipe of re-inforced concrete. il Eng N 73:816-18 Ap 29 '15

Method of grouting leaky bottom of concrete standpipe, Greenfield, Mass. Eng & Contr 44: 78 Jl 28 '15

Proper design and construction of concrete standpipes. L. J. Mensch. Eng N 73:836-7 Ap 29 '15

Serviceableness of reinforced concrete stand-pipes. Eng & Contr 43:330 Ap 14 '15

Watertightness of high concrete standpipes. Eng N 73:833-4 Ap 29 '15

See also Water towers, Concrete

Modification of starch by gaseous hydro-chloric acid. F. C. Frary and A. C. Dennis. J lnd & Eng Chem 7:214-16 Mr '15

Starch-forming enzyme from malt; its action on the hemicelluloses and its commercial application to brewing. C: B. Davis. il J Ind & Eng Chem 7:115-18 F '15

Testing starch. Textile World 49:664-5 S '15 Stars

Comparison of stellar radiometers and radiometric measurement on 110 stars, W. W. Coblentz, il diags U S Eur Stand Bul 11:613-56 My 27 '15

Evolution of the elements; the evidence of the stars. J: W. N. Sullívan. Sci Am S 79:282 stars. J: My 1 '15

Machine that measures the heat of stars. il Sci Am 113:49 Jl 10 '15

Measurement of the distances of the stars. F W. Dyson. Sci Am S 80:162-3, 182 S 11-18 , 15

Starters, Electric. See Electric starters

Starting resistance. See Electric motors-Starting resistance

te aid to commerce. See Great Britain— Board of trade; United States—Federal trade commission

State aid to science. See Science and state State bridges. See Highway administration

State engineers State civil and mechanical engineer and architect. Eng N 74:379 Ag 19 '15

State geologists State geological and mining officials. Eng & Min J 99:104 Ja 9 '15 State rights

Right of the states which is often overlooked; constitutional duty of federal government to protect from harmful regulation of com-merce by sister states. A. P. Thom. Ry Age 59:49-53 JI 9 '15

See also Water power-United States

State technical bureaus. See Engineering bu-

Stationery
Railway storekeepers' association: committee
report. Ry Age 58:1044-5 My 21 '15

Stationery trade

British India. U S Sp Cons Rep 72:312-17 '15

Paper and stationery trade of the world. G.

Dawe. U S Sp Cons Rep 73:1-458 '15

Stations, Railroad. See Railroads-Stations

Statistics

raphs, charts and statistics as aids to administration. E. C. Stothart. Elec Ry J 46: 665-7 O 2 '15

How to use statistics in management. F. G. Coburn. Eng M 49:717-23 Ag '15
Joint committee on standards for graphic

presentation; preliminary report. Am Soc M E J 37:vii-ix Ag '15; Same. Am Inst Min E Bul 106:ix-xii O '15; Same. J Ind & Eng Chem 7:894-5 O '15; Same cond. Eng Rec 72:633 N 20 '15

ractical applications of the principles of statistics. C: S. Ruffner, Assn Eng Soc J 53:264-80 D '14 Practical

Sce also Census; also subdivision Statistics under names of special subjects, e. g. Railroads—Statistics

Steam

Diagram for throttling calorimeter. R. S. Bayard. Power 42:618 N 2 '15 Heat losses in steam transmission; abstract. W. L. Cathcart. Am Soc M E J 37:611 O '15

How to make steam from slag. W. L. Johnson, diags Iron Tr R 55:1139-40 D 17 '14

Steam disinfection for sewage on common carriers, diag Eng Rec 71:43 Ja 9 '15; Same (Sewage treatment on trains and boats). Eng M 48:917-18 Mr '15

Steam versus air for power tools. Metal Work 82:796+ D 18 '14

Thermal properties o Chem 7:74-5 Ja '15 of steam. J Ind & Eng

See also Boilers; Condensers (steam); Exhaust steam; Steam engines; Steam flow; Steam heating; Steam pipes; Steam turbines; Steamboats; Superheated steam;

Cost

Cost of steam, C. W. Howard. Power 41:273 F 23 '15

Cost of steam. H. L. Strong. Power 41:133 Ja.

Simplified method of determining cost of coal per 1000 lb. of steam; chart. W. H. Schott. Elec W 66:754-6 O 2 '15; Same. Power 42: 456-8 S 28 '15; Same. Eng & Min J 100:636-8 O 16 '15

Steam costs in 6600-hp. boiler plant. F. G. Philo. Power 41:368-9 Mr 16 '15

Steam, Exhaust. See Exhaust steam

Steam, Natural

Using volcanic steam for the production of electrical energy, il Sci Am 112:97-8 Ja 30

Steam, Superheated. See Superheated steam

Steam accumulators
Step-bearing accumulator for a vertical turbine, W. R. Bankhead, il diag Power 41:
265-6 F 23 '15

Steam automobiles. See Automobiles, Steam Steam boilers, See Boilers; Steam engines Steam buses. See Motor buses, Steam

Steam cookers Low pressure steam for cooking apparatus.
D. S. Boyden, diags Metal Work 84:639-40
N 19 '15

Test of low pressure steam vegetable cooker. Am Soc Heat & V E 20:421-4 '14

Steam engineering
Draining high-pressure steam piping, C: L.
Hubbard, diags Power 42:613-15 N 2 '15
Explosives of the engineer's department, Int
Marine Eng 20:412-13 S '15

See also Boiler plants; Boilers; Locomotives; Marine engineering; Steam engines; Steam plants; Steam turbines; Steambats; Stokers, Mechanical; Superheated steam

### Examinations

Examination questions. Power 41:401 Mr 23 '15 Examining the examiner. Power 41:156-7 F

Steam engineers

Hearing on Massachusetts licensing bill. Power 41:418-19 Mr 23 '15

Steam engines

Auxiliary exhaust valves on uniflow engines.
A. D. Skinner, diag Power 41;448-50 Mr 30
'15

A. D. Skinner, diag Power 41:148-50 Mr 30

Auxiliary exhaust valves on uniflow engines.
R. Trautschold. Power 42:59-60 Jl 13 '15

Auxiliary exhaust valves on uniflow engines.
W. Turnwald. Power 41:515-16 Ap 13 '15

Comparative economy of discharging steam
from evaporator into hot well, condenser or
low pressure receiver. H. A. Everett. Int
Marine Eng 20:268-9 Je '15

Compensators for Corliss governors. C: L.
Ware. diags Power 42:93-4 Jl 20 '15

Difference in the compression curve on indicator diagrams from different engines.
Power 42:540-1 O 19 '15

Engine for Karpen plant. L. H. Morrison;
T: Wilson. Power 41:27-9 Ja 5 '15

First Stumpf una-flow engine built in America. il Power 40:701-4 N 17 '14; Same cond.
Eng M 48:580-2 Ja '15

First Stumpf una-flow engine built in America. Sibley J 29:111-12 Ja '15; Same. Sci
Am S 79:83 F 6 '15

First uniflow plant on Pacific coast, Hotel

Rosslyn. Los Angeles il plan Power 41:748.

ica. Sibley J 29:111-12 Ja '15; Same. Sci Am S 79:83 F 6 '15
First uniflow plant on Pacific coast, Hotel Rosslyn, Los Angeles. il plan Power 41:748-50 Je 1 '15
Forty years' advance in steam power units. il Power 41:302-4 Mr 2 '15
High-pressure unaflow engine. R. Cramer. Silley J 30:33-5, 64-5 O-N '15
Historical note on Reynolds girder frame Corliss engine. il Mach 21:492 F '15
Influence of indicator connecting pipes. T: W. Morley. diag Power 41:622-3 My 4 '15
Internal-combustion vs. the steam engine. Power 42:513-14 O 12 '15
Life work of Centennial engine; the mammoth Corliss exhibited at the Centennial exposition in 1876. S. H. Viall. il plan Power 42: 52-4 Jl 13 '15
Outline specification of reciprocating engine. M. B. Smith. Power 42:771 N 30 '15
Pipes for steam engines. F: W. Salmon. Power 41:88 Ja 19 '15
Principles of engine design. Engineer 119:182 F' 19' 15
Recent development in the construction of the uniflow engine. I. Streep of the steam of the uniflow engine.

Recent development in the construction of the uniflow engine. J. Stumpf. il diags Power 41:396-400 Mr 23 '15 Review of paper by F. Foster. Engineer 119: 162 F 12 '15

162 F 12 15
Setting the valves of a four-valve engine. H. Wiegand. Power 41:266-7 F 23 '15
Similarity in mechanical design: abstract. F. Foster. Engineer 119:117 Ja 29 '15
Steady flow of steam through a nozzle or throttle. H. L. Callendar, Am Soc M E J 37: 241-2 Ap. '15
Steam-engine cycles. Power 41:210-11 F 9 '15
S.-T. uniflow engine. A. A. Whitney. Power 42:728 N 23 '15
S. T. uniflow engine. diags Power 42:608-9 N 2 '15

2 '15
Superheat for Corliss engines. E. R. Pearce.
Power 40:886 D 22 '14
Turbines vs. engines in units of small capacities, J. S. Barstow. Am Soc M E J 37:511-15
S '15; Same. Sci Am S Stradts D 4 '15;
Same cond. Power 42:278-80 Ag 24 '15; Excepts. Eng & Min J 100:392-3 S 4 '15
Two new Nordberg engines. il diags Power 41:118-20 Ja 26 '15
Uniflow or una-flow. Power 41:201-2 F 9 '15

Uniflow steam engine. diags Power 41:570-1 Ap 27 '15; Same. Sci Am S 80:76 Jl 31 '15

Uniflow undertype engine. diags plan (supp)
Engineer 118:530 D 4 '14
Use of steam from the receiver of a compound
engine. A. Beaurrienne. Am Soc Heat & V
E 19:228-43 '13
What causes the high afficiency of leconomy

What causes the high efficiency of locomobiles? E. R. Pearce, Power 41:633 My 11 '15; Same (Superheated steam engines). Sci Am S 80:304 N 6 '15

Social N 6 '15
See also Blowers; Condensers (steam);
Flywheels; Governors (machinery); Heat
engines; Indicators; Locomobiles; Locomotives; Marine engines; Safety valves; Steam
plants; Steam turbines; Steamboats; Tractors; Valves

## Safety devices and measures

How an operating engineer can prevent accidents. diag Elec W 66:589-90 S 11 '15

## Specifications

Engine specifications. J. C. Hawkins. Power 42:691-2 N 16 '15

### Testina

Acceptance test of high-speed poppet-valve engine, il diag Power 42:332-3 S 7 '15 Blooming-mill engine test, Iron Age 94:1278-9

Blooming-mill engine test, from Age 94.1218-9 D 3 '14
Results of test of poppet-valve engine, il Elec W 66:942 O 23 '15
Test of large reversing engine and rolling mill, K. Nibecker, il diags Eng Soc W Pa 30:533-65 Ji '14; Abstract, Am Soc M E J 37:55-6 Ja '15; Discussion, Eng Soc W Pa 30:565-640, 804-8 Jl, N '14
Tests of engine of new design, il Iron Tr R 55:1047-9 D 3 '14
team fitting See Steam pines

Steam fitting. See Steam pipes

team flow
Flow of air and steam through orifices. A. L.
Westcott. diag Power 42:515-16 O 12 '15
Flow of steam in pipes; two new tables. W:
Kent. Ind Eng 15:51-2 F '15
Flow of steam in pipes; with discussion. W. F.
Verner. Am Soc Heat & V E 20:151-85 '14
Heat losses and economical design of steam
piping. A. L. Johnston, jr. Eng M 48:694-703
F '15

Horsepower constants for G. E. type F steamflow meter. H. E. Collins. Power 41:773-6 Je 8 '15

Will Quizz asks about the shape of steam nozzles, Power 41:56 Ja 12 '15

cheam gages
Check valve used to protect a steam gage and prevent indicating errors, diag Elec W 66: 416 Ag 21 '15
Clips for securing date tags to steam gages and safety valves. C. L. Dickert, diags Ry Age (Mech ed) 89:131-2 Mr '15
Operation of a steam gage, Int Marine Eng 20: 361 Ag '15

Steam heating

team heating
Adding new radiation to old heating plant.
plans Dom Eng 72:344-5 S 18 '15
Air return line system pro and con. Meta
Work 84:320-1 S 3 '15
Cause of drop in pressure in pipes. I. N
Evans. Heat & Ven 12:35-6 N '15
Change in plan of heating system. plans Don
Eng 73:12-14 O 2 '15
Church warmed by cast-iron vectional boiler
il plans Metal Work 83:98-100 Ja 3 '15
Connecting high pressure boiler to cast iror
radiators and taking care of the return
Dom Eng 73:109-10 O 23 '15
Core sand in the heating system. Locomotive
30:110-12 O '14
Crude oil as fuel in heating systems. H. S
Haley, diags Dom Eng 70:104-6, 139-41 Ji
23-30 '15 whend clean heating I. N. Frans

Haley. d 23-30 '15

23-30 '15
Data on overhead steam heating. I. N. Evans
Heat & Ven 12:41-2 S '15
Developments in steam heating. J. Hoffman
diags Metal Work 84:517-18 () 22 '15
Does it take a greater amount of heat initi
ally to heat with live steam than with ex
haust steam? I. N. Evans. Heat & Ven 12
39-43 Ja '15

Economical design of low-pressure stean mains. A. L. Johnston, jr. Eng M 49:28-3 Ap '15

Steam heating Continued

team heating Continued
Expanses steam versus live steam for heating.
Power 42:150-60 Ag 3-15
Exhaust vs. live steam heating. A. P. Hyde;
H. Allen, Power 12:762-3 N 30-15
Expense of operating heating and ventilating plants; with discussion. H. M. Hart,
Am Soc Heat & V E 19:309-27-13
False-water-line arrangement for steam-heating systems, diag Elec W 66:1208 N 27-15.
Features of economical church heating plant, il plans Metal Work 83:405-8 Mr 19-15
Gifford automatic vacuum system of steam heating, diag Heat & Ven 12:58 Ag '15
Heating a house, plans Metal Work 84:591 N

5 '15
Heating a two-story brick schoolhouse: description of a gravity steam system. il plans Eldg Age 37:53-5 Ja '15
Heating and plumbing in paint factory. il Aletal Work 84:272-3 Ag 27 '15
Heating and ventilating plant for the Missouri state capitol; reversible system of air supply for house and senate chambers. il diags plans Heat & Ven 12:13-21 My '15
Heating equipment for large greenhouse. G: W. Loeber. il diags Metal Work 83:66-70 Ja 1 '15
Heating equipment in Loomis institute, Wind-

Heating equipment in Loomis institute, Windsor, Conn. if plan Metal Work 83:354-5 Mr

Heating equipment of modern steam laundry, ii plan Metal Work 84:515-16 O 22 '15 Heating system for building and bakery, plans Dom Eng 73:209 N 13 '15 Heating system with defective circulation, plans Dom Eng 71:38-9 Ap 10 '15 Heating value of exhaust steam. D: M. Myers. Eng M 49:712-17 Ag '15 Heating value of exhaust steam. D: M. Myers. Sch Mines Q 36:40-7 N '14 How to run piping for steam radiators. W. H. Wakeman, diag Dom Eng 71:63 Ap 17 '15 Inexact statements in manufacturers' catalogues, Heat & Ven 12:53-5 F '15 Kelmac vapor heating, diag Heat & Ven 12:57 Ag '15

Ag '15 Lift fittings and lift pockets in vacuum steam heating work. T. W. Reynolds, diags Heat & Ven 12:48-9 Ja '15 Making quick repairs on heating plants. W. H. Wakeman, diags Dom Eng 71:155-6 My 8 '15 Merits of vapor systems for house heating. N. W. Taplin, Metal Work 83:475-6 Mr 26

Methods of dripping steam mains, diags Heat & Ven 11:35-7 D '14

Methods of dripping steam mains, diags Heat & Ven 11:35-7 D '14
Miter coils for exhaust steam heating, A. G. Solomon, diag Power 42:306 O 12 '15
Miter coils for steam heating, T. B. Hyde, Power 42:623-4 N 2 '15
Modern practice in heating and ventilation, A. G. King, il diags Dom Eng 68:124-6; 69: 354-5; 70:2-4, 268-9, 366-8; 71:2-3, 92-3, 182-4, 276-8; 72:2-4, 102-4, 310-12 Ag 1, D 19 '14, Ja 2, F 27, Mr 20, Ap 3, 24, My 15, Je 5, Jl 3, 24, S 11 '15
Office-building service data, W. B. Metz.

3, 24, S 11 '15 Office-building service data. W. R. Metz. Power 42:125-6 Jl 27 '15 Ordinary wastes in the power plant. C: L. Hubbard. plans Eng M 49:809-17 S '15 Overcoming back pressure in heating systems. I. N. Evans. Heat & Ven 12:44-6 O

tems. I. N. Evans. Heat & Ven 12:44-6 O '15
Pipe sizes; tables. Heat & Ven 11:39 D '14
Pressure survey study constituting a report on the comparative use of exhaust and live steam for heating. C. C. Wilcox. diag plans Heat & Ven 12:23-32 Ag '15; Abstract. Elec R & W Elec'n 66:1120 Je 12 '15
Problem in cooling condensation. T; Tait. Dom Eng 70:335-6 Mr 13 '15
Problems in power-plant design. (Engineers' study course) C: L. Hubbard, plans Power 40:394-7; 41:66-8 D 22 '14, Ja 12 '15
Question concerning return of condensation. diag Dom Eng 73:238 N 20 '15
Question in heating engineering; piping. T; Tait. plan Dom Eng 70:205-6 F 13 '15
Standard details of heating and ventilating work. F. G. Mc Cann. diags plans Metal Work 81:31-3, 125-6, 234-5, 302-3, 363-4, 421-4, 494, 511+, 606-7; 82:273-4, 460, 766-7; 83:149-50, 281-2 Ja 2, 16, F 6, 20, Mr 6, 20, Ap 3-10, My 1, S 4, O 2, N 27 '14, Ja 22, F 19 '15

Suburban residence heated by vapor system; gas fuel for boiler, il plans Metal Work 83: 385-7 Mr 12 '15
Swimming pools; construction, mechanical installation, water supply, heating the water, various types of installations. A. G. King. diags Dom Eng 69:254-6, 320; 70:34-5, 101-2 N 28, D 12 '14, Ja 9, 23 '15
Time element in heating a building. Heat & Ven 12:45-6 Mr '15
Twenty-five years ago. S. A. Jellett. Dom Eng 69:410 D 26 '14
Unsatisfactory heating system. diags plans Dom Eng 69:328-9; 71:218-20 D 12 '14, My 22 '15

'15
Vacuum heating systems. W. L. Durand. Power 41:605 My 4 '15
Vacuum heating without thermostats. D. N. Crosthwait, jr.; W. L. Durand. Power 41: 346 Mr 9 '15
Vacuum system in an apartment building, il plans Metal Work 84:114-15 Jl 23 '15
Vapor system in house heating, il diags plans Bldg Age 37:51-4 F '15

See also Heating: Hot water heating:

See also Heating; Hot water heating; Radiators; Steam flow; Steam pipes

Steam meters

team meters
Curnon steam meteř, il diags Power 41:545-6
Ap 20 '15
District heating, S. M. Bushnell and F. B.
Orr. il diags Heat & Ven 12:32-7 F; 36-41
Mr; 37-41 Ap '15
Horsepower constants for G. E. type of F
steamflow meter. H. E. Collins, Power 41:
773-6 Je 8 '15
Recording power plant operations, J. C. Smallwood, il diags Eng M 49:818-36 S '15
Simplex condensation meter, il Power 41:569
Ap 27 '15
Steam meters, il Elec W 65:871-2 Ap 3 '15

Steam meters. il Elec W 65:871-2 Ap 3 '15

Steam motor buses, See Motor buses, Steam

Steam navigation

See also Boilers, Marine; Steam engines; Steamboats

Steam pipe coverings

Efficiency of commercial pipe coverings. L. B.

McMillan and H. S. Rekersdres. il Metal
Work 82:794-6 D 18 '14

Producing magnesia pipe and boiler covering.
F. W. Bartlett. Power 42:426-7 S 21 '15

Steam pipes

Blowing out steam lines. W: Hirst. diag Power 42:161-2 Ag 3 '15

Details of heating and ventilating work. F. G. McCann. diags Metal Work 84:551 O 29 '15 Draining high-pressure steam piping. C: L. Hubbard. diags Power 42:613-15 N 2 '15

Economical design of low-pressure steam mains, A. L. Johnston, jr. Eng M 49:28-34 Ap '15

Elasticity and endurance of steam pipes. C. E. Stromeyer. Power 41:278-81 F 23 '15

Five hundred kilowatts from exhaust of hoisting engine. T: Wilson, il diags plan Power 42:143-6 Ag 3 '15

Flow of steam in pipes; two new tables. W: Kent. Ind Eng 15:51-2 F '15

Flow of steam in pipes; with discussion. W. F. Verner, Am Soc Heat & V E 20:151-85 '14 Heat losses and economical design of steam piping. A. L. Johnston, jr. Eng M 48:694-703

Heat lost from underground steam pipes. I. N. Evans. plan Heat & Ven 12:39-40 Ag '15

Installation of steam piping. S. U. Tuspin. diags Elec W 65:415-16 F 13 '15

New pipe chart and tables based on square feet of radiation. T. W. Reynolds, Heat & Ven 12:22-5 N '15

Notes on some recent researches. J. E vel. diag Engineer 120:433-4 N 5 '15

Piping and supports in municipal plant. A. I Williams. il diags Power 41:463-5 Ap 6 '15 Power piping society. Iron Age 96:388 Ag 12

Steam pipes; formulas. Power 42:306 Ag 31 '15 Stresses in steam pipes, S. U. Tuspin, Elec W 65:926-7 Ap 10 '15

Steam pipes—Continued
Table of the principal dimensions of pipes.
Power 42:400-1 S 21 '15
Two ways of piping steam pumps. W. H.
Wakeman, diags Dom Eng 72:138 Jl 31 '15 See also Piping (power plants); Steam heating; Steam traps

Steam plants

team plants
Addition to the Westport power plant. W. O. Rogers. il plan Power 41:390-5 Mr 23 '15
Auxiliary station for transmission system; turbine of Mount Holly steam station of the Southern power company operates as synchronous motor when not under load. C. A. Mees. il plans Elec W 65:774-8 Mr 27 '15
Auxiliary steam plant of the Vancouver Island power company. H. W. Beecher. il plans Elec R & W Elec'n 67:373-8 Ag 28 '15
Auxiliary steam power plant for Vancouver island; steam turbine driven plant using oil fuel. W. L. Kidston. il plan Power 42:634-8 N 9 '15
Building a power station upon one in service.

8 N 9 10 Building a power station upon one in service, il diag plan Elec W 66:965-7 O 30 '15 Central generating system for University of Michigan, il plans Elec W 65:646-51 Mr 13 '15

'15
Changes in an old plant. N. L. Schloss, plan
Power 42:120-1 Jl 27 '15
Chimneys for oil- and coal-burning plants.
F. H. Rosencrants, Power 41:637-8 My 11 '15
Coal and ash handling at the gorge plant of
the Northern Ohio traction & light co. A. D.
Williams, il diag Power 42:398-400 S 21
'15

Combination electric heating plant, Laramie, Wyo, A. E. Anderson. il Power 42:602-5 N

Z 15 Commercial value of exhaust steam. A. L. Johnston, jr. Eng M 49:327-33 Je '15 Connors creek power 'plant, Detroit. C. F. Hirshfeld. il diags plans Power 42:388-96 S 14 '15; Same cond. Am Soc M E J 37:499-508

14 '15; Same cond. Am Soc M E J 37:499-508 S '15
Convenient operating reports for steam plants. Elec W 65:1623-6 Je 19 '15
Cunniverland Edison power plant. W. O. Rogers, il plans Power 42:704-9 N 23 '15
Curves showing steam-station performance. Elec W 66:532-3 S 4 '15
Delray power plants. N. G. Reinicker, il plans Power 42:286-90, 343-4, 414-15, 435-6 Ag 31, S 7, 21-28 '15
Developments in steam-electric generating stations. J: Hunter. Power 40:897-9 D 22 '14
Easy calculation of steam coal required by power plants. R. E. Horton. Eng N 73:490 Mr 11 '15; Same. Power 41:622 My 4 '15
Economics of electric power station design. H. F. Parshall. Elec W 66:690 S 25 '15
Enlarging a steam reserve station; problems involved in rehabilitating the Consolidated gas, electric light & power company's Westport station. J. C. Lathrop, il diags Elec W 65:1161-8 My 8 '15
First uniflow plant on Pacific coast, Hotel Rossbyn, Los Angeles, il plan Power 41:748-50 Je 1 '15
Fort Wayne, station, rebuilt. T: Wilson, il

Rosslyn, Los Angeles.

Je 1 '15
Fort Wayne station rebuilt. T: Wilson. il plans Power 42:534-9 O 19 '15
Getting the proper vacuum in summer. J. Wilmore. diags Elec W 66:358-63 Ag 14 '15
Handling summer and winter loads in Newark Y. M. C. A. il diags Elec W 66:1082-4, 1203-5 N 13, 27 '15
Havana consolidated power plant. C. W. Ricker, il diags Power 42:218-22, 257-61 Ag 17-24 '15
How not to waste steam in creosoting plants.

How not to waste steam in creosoting plants. A. M. Lockett. Eng Rec 71:145 Ja 30 '15 Isolated power-house for factories. W. E. Francis. il Gen Elec R 18:1057-65 N '15 Lowellville, Ohio, turbine plant. W. O. Rogers. il diags Power 42:128-42 Ag 3 '15 Mechanical handling of coal and ashes in the power plant. C. C. Brinley, il diags Eng M 49:872-87; 50:65-77 S-O '15 Modern power-house condensing plant. A. Arnold. Inst E E J 53:848-50 Je 15 '15 New Morrison hotel plant, Chicago. T: Wilson. il plans Power 42:70-3, 111-15 Jl 20-27 '15 New Penn Central power co.'s Williamsburg plant. W. O. Rogers. il plans map Power 42: 570-8 O 26 '15

New plant at the Stepney electricity works. il diags Engineer 120:385-8, 390 O 22 '15
New traveling screens at Delray. C. F. Hirshfeld. il diag Power 41:333-4 Mr 9 '15
New York Interborough power plant enlargement. il diags Elec Ry J 45:744-9 Ap 17 '15;
Same. Elec W 65:975-9 Ap 17 '15
Oil-burning stand-by plants. C. H. Delany. Power 42:172-5 Ag 3 '15; Abstract. Elec W 65:195-14 Je 12 '15
Oil-burning steam station in Seattle, Wash. il Elec W 65:99-101 Ja 9 '15
Oil separation from water of condensation; abstract. M. Vahle. diags Am Soc M E J 37: 345-6 Je '15
Operating features of a small plant; details of power-plant layout, operating conditions, condensing arrangements and motor service. il diag Elec W 66:355-7 Ag 14 '15
Ordinary wastes in the power plant. C: L. Hubbard. plans Eng M 49:809-17 S '15
Paper mill power plants. W. Weaver. Power 42:349 S 7 '15
Piping and supports in municipal plant. A. D. Williams. il diags Power 41:463-5 Ap 6 '15. Possible lines of power plant progress. C. C. Thomas. Elec Ry J 45:939 My 15 '15
Power plant at Kincaid, Ill. T: Wilson. il diags plans Power 42:30-4 S 28 '15
Power plant of American engineering company, il plans Power 41:38-40 Ja 12 '15
Power plant of new Lumber exchange building, Chicago. T: Wilson. il plans Power 41: 764-70 Je 8 '15
Power plant of the Granby co. T: Wilson. il plans Power 42:2-7 Jl 6 '15; Abstract. Eng

ing, Chicago. T: Wilson. il plans Power 41: 764-70 Je 8 '15
Power plant of the Granby co. T: Wilson. il plans Power 42:2-7 Jl 6 '15; Abstract. Eng & Min J 100:113-15 Jl 17 '15
Power plant of the J. B. Stetson company. W. O. Rogers. il diag Power 41:112-15 Ja 26 '15

Power plant of the new Equitable building, New York. il Elec W 66:81-5 Jl 10 '15 Power plants as nuisances. A. L. H. Street. Power 42:436-7 S 28 '15 Private electrical plant at Kensington. il diags Engineer 120:432-3, 436 N 5 '15 Problems in power-plant design. (Engineers' study course) C: L. Hubbard. plans Power 40:758-60, 790-2, 820-2, 858-60, 894-7, 931-2; 41: 32-4, 66-8 N 24-Ja 12 '15 Proposed Manchester generating station. S. L. Pearce. Elec R & W Elec'n 67:672-3 O 9 '15 Record keeping in the power plant. S. J. H.

Record keeping in the power plant. S. J. H. White. Power 41:243-4 F 16 '15

Reduction of power costs in a factory power plant. T. K. Roberts. diags Ind Eng 14:445-50

Savage manufacturing co.'s power plant, Savage, Md. W. O. Rogers, if plans Power 42: 38-43 Jl 13 '15

Seattle municipal lighting plant. W. L. Kidston il plans Power 41:182-5 F 9 '15

Seventy-fourth street station and its necross-compound turbines. C: H. Bromley. Power 41:528-32 Ap 20 '15

Springfield (Ohio) railway power plant rebuilt without interfering with operation. i diags plan Elec Ry J 46:898-902 O 30 '15

Stand-by plant supplying steam to centra heating system. G. Broili. Power 41:726 My 25 '15

Standard iron co.'s steam-turbine power plant O. C. Thomas. il Power 41:49-50 Ja 12 '15

Steam-turbine installation in Mexico. J: Klemm diags Power 41:192-3 F 9 '15; Same. Eng & Min J 99:603-4 Ap 3 '15

Tom Hunter, hoisting engineer. W. O. Rogers il Power 41:160-2; 42:548-50 F 2, O 19 '15

Two American-built locomobile power plants il diags Elec W 65:407-11 F 13 '15

Use of superheated steam, L. P. St. Cyr. Power 42:87-8 Jl 20 '15

Using volcanic steam for the production of electrical energy. il Sci Am 112:97-8 Ja 30 '1 Virginia power company's Cabin Creek plant il diags plan map Elec W 66:239-44 Jl 3 '15

Warren state hospital power plant. W. O Rogers, il diags plan Power 42:362-5, 408-1: S 14-21 '15

Steam plants-Continued

Washington avenue power plant, Scranton, Penn. W. O. Rogers, il diag Power 41:868-76 Je 29 '15

See also Blowoff tanks; Boiler plants; Boilers; Electric plants; Feed water heat-ers; Piping; Steam engineering; Steam en-gines; Steam turbines

## Safety devices and measures

Safety in isolated power plants. il Am Ind 16: supl-4 Ag; supl-4 O '15

Power plant testing. W. M. Selvey, diags Inst E E J 53:109-18; Discussion. 53:118-45, 191-8 Ja 1-15 '15 Tests of large steam hoists. H. E. Spring. Gen Elec R 18:179-89 Mr '15

Steam purifiers
Tracy steam purifier, il Power 42:413 S 21 '15 Steam regeneration. See Exhaust steam

Steam shovels
Biggest steam shovel; excavator built for stripping coal beds. diags Eng M 50:452-3

D'15
Combination crowding feature of Thew revolving shovel. il Eng Rec 72:466 O 9 '15; Eng & Contr 44:295-6 O 13 '15
Grade-board for steam-shovel use. L. B. Pringle. Eng & Min J 99:572 Mr 27 '15
Individual electric lighting outfits for steam shovels. Eng N 73:24 Ja 7 '15
Individual electric lighting plants for steam shovels. il Elec R & W Elec'n 66:90-1 Ja 9 '15; Inon Age 94:1396 D 17 '14; Eng & Min J 99:15 Ja 2 '15; Colliery 35:397-8 F '15
Large steam shovel. il Engineer 119:362 Ap 9 '15

Methods of excavation for buildings. A. B. McDaniel. il diags Eng Rec 71:68-70 Ja 16 '15 Operation analysis of new machines which cheapen the moving of earth on road work. A. B. McDaniel. il Eng Rec 72:126-8 Jl 31 '15

'15
Revolving shovel, il Good Roads n s 9:118-19
Mr 6 '15; Eng N 73:540-1 Mr 18 '15; Eng &
Min J 99:865 My 15 '15
Steam shovel burrows its way out of cut, il
Eng N 74:365-6 Ag 19 '15
Steam shovel cuts costs of repairing subgrade
on paving contract. A. D. Blakeslee, Eng
Rec 72:239-40 Ag 21 '15
Steam shovel digs 48-inch pipe trench in busy
street. F: H. Pond. il Eng Rec 71:693-4 My
29 '15

t costs of steam shovel work in Cuba. M. Bischoff. Eng & Contr 44:276-8 O 6 '15 See also Buckets

# Safety devices and measures

Safety first on steam shovels, il Eng Rec 71: 151 Ja 30 '15

Steam tables

Electric steam tables for lunch counters and restaurants. il Elec W 66:770 O 2 '15

Steam traps

Cookson return steam trap, il diag Power 41: 588 Ap 27 '15

De Lancey tubular-valve steam trap. il Power 42:596 O 26 '15

Duplex steam trap and boiler feeder. il Power 42:85 Jl 20 '15

Locating and piping steam traps. W. H. Wake-man. diag Dom Eng 71:305 Je 12 '15

Lytton thermo syphon trap. diag Power 42:51 Jl 13 '15

Modern practice in heating and ventilation. A. G. King. il diags Dom Eng 68:124-6; 69: 354-5; 70:2-4 Ag 1, D 19 '14, Ja 2'15 Radiator traps and test data. L. M. Arkley. diag Heat & Ven 12:37-9 S '15

Report of tests of radiator steam traps. J. A. Donnelly. Am Soc Heat & V E 19:197-201

Return steam trap. diag Power 41:193 F 9 '15 Return traps for feeding boilers. K. M. Gilbert. diags Power 41:467-8 Ap 6 '15

Scheme for the disposal of high and low pressure steam drips. Elec W 66:301 Ag 7 '15

Test of radiator steam traps, engineering department, state of California. E. D. Griffiths. plan Am Soc Heat & V E 19:194-6

Steam turbines

calculation of centrifugal stresses in turbine rotors; abstract. W: Kerr. Am Soc M E J 37:298-9 My '15 Circulating-oil system of lubrication. plans Elec W 65:411 F 13 '15 Comparison costs, steam turbine and Diesel engine, 600 kw. power plant. Elec W 66: 807 O 9 '15 Comparison type, steam turbine diags. Power

807 O 9 '15
Composite-type steam turbine. diags Power
41:436-7 Mr 30 '15
Determination of pressure variation in steam
turbines and of dimensions of nozzles by
means of the JS diagram; abstract. Schmolke. Am Soc M E J 37:411-12 J1 '15
Difference between reaction and impulse turbines H A Everett Int Marine Eng 20:82-3

bines. H. A. Everett. Int Marine Eng 20:82-3 F '15

F '15
Dimensions, weights and costs of steam turbines. A. A. Potter and S. L. Simmering. Power 41:750 Je 1 '15
Effect of vacuum in steam turbines. G. G. Stoney. Engineer 118:521-3 N 27 '14; Same cond. Sci Am S 79:69 Ja 30 '15; Same cond. Power 41:312-16 Mr 2 '15; Discussion. Engineer 118:502-3 N 27 '14
Exhaust steam turbine practice. C. A. Tupper. il Iron Tr R 55:1031-5+ D 3 '14
Exhaust steam turbines. il Colliery 35:619-20 Je '15

Je '15
Five hundred kilowatts from exhaust of hoisting engine. T: Wilson, il diags plans Power 42:143-6 Ag 3 '15
Forty years' advance in steam power units, il Power 41:302-4 Mr 2 '15
Future central station development. J. A. Moyer. Elec Ry J 45:987 My 22 '15
Gland packing, diags Elec W 65:416 F 13 '15
High steam economy shown by Swedish steam turbine. Elec W 66:919-20 O 23 '15
How to select your prime mover. G. Fisk, Iron Tr R 57:569-72+ S 23 '15
Lining up small turbine sets. J. H. Hurley. Power 41:714-15 My 25 '15
Losses in steam turbines, Elec Ry J 45:785 Ap 24 '15

15 24

Low-pressure turbine at the Carpenter steel mill. il plan Power 42:74-5 Jl 20 '15
Low-pressure turbine manifestation. I. L. Benedict. Power 41:326-7 Mr 9 '15
Low-pressure turbines in steel mills. F. G. Cutler. Power 40:827-8 D 8 '14
Metropolitan needs and sizes of prime movers. il Elec W 66:799-801 O 9 '15
Most economical vacuum for turbines, W. H. Herschel. Power 41:744-7 Je 1 '15
Operating experiences with bleeder-type turbines. F. W. Laas. Power 42:28-9 Jl 6 '15; Abstract and discussion. Elec R & W Elec'n 66:1118 Je 12 '15; Excerpt. Elec W 65:1622 Je 19 '15
Possible economies from the use of exhaust

Possible economies from the use of exhaust steam in a water gas plant. S. A. Reinhard and C. A. Schnerr. Am Gas Light J 102:226-7 Ap 12 '15

7 Ap 12 '15
Present status of prime movers. H. G. Stott,
R. J. S. Pigott and W. S. Gorsuch. Am Inst
E. E. Pro 33:954-62 Je '14; Discussion. 34:
S5-102 Ja '15
Relation between steam-turbine rating and
water rate. Elec W 66:753-4 O 2 '15
Ridgway steam turbine. It diags Power 41:5668 Ap 27 '15
Rolling mill with steam turbing driver plant of

Rolling mill with steam turbine drive: plant of the Carpenter steel company. il plan Iron Age 94:1221-4 N 26 '14; Same. Iron Tr R 55:937-1000 N 26 '14; Same. Power 41:455-6 Mr 30 '15; Same cond. Eng M 48:591-3 Ja '15 Seventy-fourth street station and its new cross-compound turbines. C: H. Bromley, il Power 41:528-32 Ap 20 '15 Small condensing turbines. W. J. A. London. il diags Power 41:426-31 Mr 30 '15

Specifications for alloys for high-speed super-heated steam turbine blading. W. B. Parker, il Engineer 120:441-3 N 5 '15

Standard iron co.'s steam-turbine power plant. O. C. Thomas. il Power 41:49-50 Ja 12 '15 Start a steam turbine slowly. F. W. Wearin. Power 42:490 O 5 '15

Steam turbines - Continued

team turbines—Continued
Steam consumption guarantees of small noncondensing turbines. W. J. A. London, Elec
W 65:1048-9 Ap 24 '15
Steam turbine blade fastenings. J. A. Capstaff, il diags Power 42:98-103 Jl '20 '15; Abstract. Int Marine Eng 20:322 Jl '15
Steam-turbine diagrams. F. R. Low. diags
Power 41:596-600 My 4 '15
Steam-turbine diagrams. P. M. Robinson

rower 41:596-600 My 4 '15
Steam-turbine diagrams. P. M. Robinson.
Power 41:650-1 My 11 '15
Steam-turbine installation in Mexico.
J: Klemm. diags Power 41:192-3 F 9 '15;
Same. Eng & Min J 9:603-4 Ap 3 '15
Steam turbine mill drive; with discussion.
J. D. Berg. il diags Eng Soc W Pa 30:778803 N '14; Abstract. Am Soc M E J 31:238-9
Ap '15
Steam turbines their

Steam turbines—their principles and opera-tion, C: H. Bromley, il diags Power 41:626-31 My 11 '15

Swiss turbo-generator sets, il diags Engineer 119:179-82 F 19 15

Things of interest in recent turbine design. Power 40:910-12 D 29 '14

Power 40:910-12 D 29 '14

Turbine examination questions. W. Leonard.
Power 42:593-4 O 26 '15

Turbines vs. engines in units of small capacities, J. S. Barstow. Am Soc M E J 37:511-15 S '15; Same. Sci Am S 80:366-8 D 4 '15; Same cond. Power 42:278-80 Ag 24 '15; Excerpts. Eng & Min J 100:392-3 S 4 '15

Turbo-blower governing devices; abstract.
A. Stodola. diags Am Soc M E J 37:181-2 Mr '15

Turbo blowers for blast-furnace blowing. R: H. Rice, il diags Am Inst Min E Bul 89; 721-43 My '14; Discussion, 100:794-809 Ap '15 Turbo-generator sets with impulse turbines, il Elec W 65:951 Ap 10 '15 1250 kw mixed pressure turbo-generator; abstract. F. Schulte. Am Soc M E J 37:651-2

Two-stage condenser, P. A. Bancel, diags Power 42:402-7 S 21 '15; Excerpts. Elec W 66:1148-9 N 20 '15 Wait turbo-generator on elevator load in the Lumber exchange building, Chicago, il diags Power 42:717-20 N 23 '15

## Foundations

Structural steel supports for large steam turbines. diags plan Eng N 73:66-9 Ja 14 '15

Steam turbines, Marine
Geared marine steam turbines, Engineer 119:
437-8 Ap 30 '15
Geared turbine Atlantic liner, Transylvania.

Geared turbine Atlantic liner, Transylvania.
plan (p. 435) Engineer 118:433 N 6 '14; Same
cond. Eng M 48:605-6 Ja '15
Geared turbines for ship propulsion; abstract.
W. D. McLaren and G. M. Welsh. Int Marine
Eng 20:89 F '15
Governing of marine stray

Eng 20:39 F 15 Governing of marine steam turbines, diags Engineer 119:235 Mr 5 15 Turbine installation on torpedo boats of the new Spanish navy. Int Marine Eng 20:516 N

# Steam valves. See Valves

Steamboat lines

Commission on relations between railways and waterways. Ry Age 58:1037-8 My 21 '15 Railroads lose lake lines. Iron Age 95:1146 My

Railroads must divorce lake steamship lines. map Ry R 56:682-5 My 22'15 Railways must abandon control of boat lines on the Great Lakes; abstract of the Interstate commerce commission's decision.

Age 58:1046-7 My 21

state commerce commission's decision. Ry Age 58:1016-7 My 21 5 Southern Pacific can continue boats on Sacramento river. Ry R 56:856 Je 19 '15 Southern Pacific may operate steamship lines to Balboa. Ry R 56:254-5 F 20 '15

Southern Pacific's ownership of the schooner Pasadena. Ry R 56:565-6 Ap 24 '15

## Steamboats

Cable-repairing steamer "Transmitter." F. C. Coleman, il plan Int Marine Eng 20:382-6

Development of the Transatlantic steamship, il Sci Am 112:523-5 Je 5 '15

Economy, F. H. Sadler, diags Int Marine Eng 20:459-63 O '15

French-built cable ship Edouard Jéramec, F. C. Coleman, il diags Int Marine Eng 20: 146-50 Ap '15 Fruit carrying steamer van Hogendorp, F. C. Coleman, il diag plans Int Marine Eng 20:67-

71 F

71 F '15
Interesting change in twin screw steamer.
D. Sawyer. Int Marine Eng 20:176-8 Ap '15
Interesting vessels of fifty years ago: the
Stevens Battery and the Monitor, W. D.
Forbes, diag Int Marine Eng 20:227-8 My '15
Interior views of the Great Northern. il Int
Marine Eng 20:334-8 S '15
Japanese liner Fushimi Maru, il plan Int Marine Eng 20:311-12 Jl '15
Lake passenger steamer Noronic, diags Int
Marine Eng 20:431-5 O '15
New P. & O. boat: the Khiva. Int Marine Eng
20:59 F '15
Red Star liner Belgenland, il Int Marine Eng

20:59 F '15 Red Star liner Belgenland, il Int Marine Eng 20:344-7 Ag '15 Shallow draft boat for the Yangtse Kiang, plans Int Marine Eng 20:490-2 N '15 Southern Pacific ferry steamer Alameda, E; W, Olin, il plans Int Marine Eng 20:194-8 My

Steamer Emblane. il plans Int Marine Eng 20:

Steamer Emblane, il plans Int Marine Eng 20: 297-8 JI '15
Steamer Francis Hanify, il diag plans Int Marine Eng 20:30-2 Ja '15
Steamship design; a method of determining the principal dimensions. H. A. Everett. Int Marine Eng 20:436-40 O '15
S. S. Great Northern and Northern Pacific for the Spokane, Portland & Seattle railway company, il diags plans Int Marine Eng 19: 535-45 D '14
Turbine passenger steamships Great Northern

535-45 D '14
Turbine passenger steamships Great Northern
and Northern Pacific, il plan (supp) Engineer 120:129-31 Ag 6 '15
Twin screw passenger and cargo steamers
Missanabie and Metagama; abstract. Int
Marine Eng 20:90 F '15
Western river steamers and barges. E. A.
Burnside. il plan Int Marine Eng 20:478-87 N
'15

White Star liner Britannic, il Int Marine Eng 19:556-9 D'14

19:556-9 D 19:556-9 D '14

\*\*See also\*\* Boilers, Marine; Car ferries; Freight ships; Marine engines; Propellers; Ship propulsion; Shipbuilding; Shipping; Steamboat lines; Tank ships; Tenders, Naval: Towboats: Warships; Yachts Naval; Towboats; Warships; Steamers. See Steamboats

Steamships, See Steamboats

teel
American society for testing materials 18th annual meeting. Ry Age 59:61-6 Jl 9 '15 .
Brittleness in steel; abstract. V. Bernard and A. Portevin. il Iron Age 96:1056 N 4 '15 Can the dissociation theory be applied to solid solutions in steels? E: D. Campbell. Am Chem Soc J 37:2039-46 S '15 Chemical and mechanical relations of iron, cobalt and carbon. J. O. Arnold and A. A. Read. Iron Age 95:953 Ap 29 '15 Constitution of the iron-carbon alloys: a chemical theory to explain the different properties by the existence of ferrated carbides. G: Auchy. Iron Age 95:50-1 Ja 7 '15 Copper steel for resisting corrosion. D. M.

Copper steel for resisting corrosion. D. M. Buck. Eng M 49:762-3 Ag '15

Corrodibility of cast iron and steel. J. N. Friend and C. W. Marshall. Iron Age 95: 1114-15 My 20 '15

Corrosion of steel and cast iron compared. R. C. McWane and H. Y. Carson, il Foundry 43:467-9 N '15

Effect of chemical composition upon the magnetic properties of steels. W. E. Ruder, Gen Elec R 18:197-203 Mr '15

Effect of displaced magnetic pulsations on the hysteresis loss of sheet steel, L. W. Chubb and T: Spooner, il diags Am Inst E E Pro 34:2321-42 O '15

Effect of finishing temperatures of rails on their physical properties and microstructure. W. R. Shimer, il Am Inst Min E Bul 99:557-85 Mr '15; Same, Iron Age 95:394-7 F 18 '15; Same, Iron Tr R 56:379-82 F 18 '15; Discussion, Am Inst Min E Bul 101:1107-11 My '15

Steel Continued

Elastic properties of steel at moderately high temperatures; abstract. F. R. Rowett. Am Soc M E J 37:419 Jl '15
Has titanium any influence on the properties of steel? F. A. J. FitzGerald, diags Met & Chem Eng 13:28-9 Ja '15; Same cond. Iron Age 95:309 F 4 '15; Summary, Elec Ry J 45: 98 Ja 9 '15

Machine steel for small tools O. D. Kinger, it

98 Ja 9 '15 Machine steel for small tools, O. D. Kinsey, il diags Ry Age (Mech ed) 89:189-90 Ap '15 Modern steels and their heat treatment, R. R. Abbott, il J Fr Inst 179:415-38 Ap '15; Same, Iron Tr R 57:981-6 N 18 '15; Same abr. Iron Age 95:790-2 Ap 8 '15; Abstract, with discussion, Am Soc M E J 37:297-71 My '15 Oxy-acetylene welding process, S. W. Miller, il Mach 22:216-18 N '15

Phosphorus in iron and steel; abstracts. W. H. Hatfield. il Engineer 120:335-6 O 8 '15; Iron Age 96:1234 N 25 '15

Protective coatings for iron and steel. E. P. Later. Foundry 42:497-8; 43:35+ D '14-Ja

Later. Foundry 42:497-8; 43:35+ D '14-Ja '15

Steel and civilization. J. O. Arnold. Sci Am S 80:227 O 9 '15

Steel—its pathology. J. E: Schipper. il diags Automobile 32:611-15, 660-3+, 706-8+, 796-800 Ap '-22, My 6 '15

Steel over 2000 years old. R. A. Hadfield. Iron Age 96:464 Ag 26 '15

Structure of carbon tool steel. J. V. Emmons. il Iron Age 95:342-3 Ap 15 '15

Surface decarbonization of tool steel. J. V. Emmons. il Am Inst Min E Bul '3:2233-48 S '14; Same cond. Iron Tr R 55:737+ O 15 '14; Same cond. Iron Tr R 55:737+ O 15 '14; Same cond. Iron Age 94:1288-90 D 3 '14; Abstract. Am Soc M E J 36:0198-9 O '14; Abstract. Ind Eng 15:27-8 Ja '15; Discussion. Am Inst Min E Bul 100:730-1 Ab 15 Symposium on iron and steel. Met & Chem Eng 13:655-7 O 1 '15

Titanium and its effects on steel. G: F. Comstock. il J Ind & Eng Chem 7:87-94 F '15; Same cond. Sci Am S 80:327 N 20 '15

Unsymmetrical hysteresis loop. J: D. Ball. Am Inst E E Pro 34:2275-97 O '15

\*\*Rec also Annealing; Armor plate; Bessemer

Nec also Annealing; Armor plate; Bessemer process; Case hardening; Cobalt steel; Concrete, Reinforced; Corrosion and anti-corrosives; Damascus steel; Electrolytic corrosion; Foundry practice; Iron; Manganese steel; Metallography; Metals; Nickel steel; Railroad ties, Steel; Rails; Silicon steel; Steel, Structural; Steel castings and other headings beginning Steel; Tool steel; Vanadium steel

## Analysis

Alumina in steel. G: F. Comstock. il Met & Chem Eng 13:891-5 D 1 '15

Chem Eng 13:891-5 D 1 '15

Analoid method for the determination of manganese in steel, iron ore and slag. Met & Chem Eng 12:793-4 D '14

Analoid method for the determination of phosphorus in steel, iron and slag. Met & Chem Eng 13:191-2 Mr '15

Determination of aluminum oxide and total aluminum in steel. F. O. Kichline. J Ind & Eng Chem 7:806-7 S '15

Determination of chromium and vanadium in

Eng Chem 7:806-7 S '15
Determination of chromium and vanadium in steel. C. H. Rich and G. C. Whittam, Met & Chem Eng 13:238-9 Ap '15
Determination of copper in steel. W. D. Brown. J Ind & Eng Chem 7:213 Mr '15
Determining carbon in cast steel rapidly. W. L. Morrison, il Foundry 43:151-2 Ap '15
Effect of oxygen on steel quality. J. A. Pickard and F. M. Potter, Iron Tr R 57:136-7+
Il 15 '15

Jl 15 '15
Electric muffle furnace for the determination of carbon and oxygen in steel and tungsten powder. C: M. Johnson. il Met & Chem Eng 13:17 Ja '15
How to detect phosphorus in steel. W. T. Stead. il Iron Tr R 57:989-90 N 18 '15
Improved method for the determination of nitrogen in steel. L. E. Barton. J Ind & Eng Chem 6:1012-13 D '14
Method for determining gases in steel P.

Method for determining gases in steel P. Goerens and J. Paquet. diag Iron Age 95: 1060-1 My 13 '15

New specifications for rails; Pennsylvania R. R. system. Eng N 74:397 Ag 26 '15

Platinum boats for carbon determination by the direct combustion method. H. F. Siever. Alet & Chem Eng 13:525 S I '15 Shells from European battlefields. il Iron Age \( \frac{96:186-7}{15:01} \) 22 \( \frac{15}{15:01} \) Simplified ferrous sulfate method for the determination of variadium in steel. G: T. Dougherty. J Ind & Eng Chem 7:419-20 My '15

### Failures

Failure and heat treatment of drill steel. S. V. Bergh. il diags Eng & Min J 99:612-14 Ap 3

'15 Failure of hollow drill-steel, T. E. Sturte-vant, Eng & Min J 99:579 Mr 27 '15 Progressive fractures from alternate bending. J: Younger, Eng N 73:1237 Je 24 '15 Surprising failure of steel ship plates. Int Marine Eng 20:50-1 F '15

### Nomenclature

Modified iron-carbon diagram. E. A. Sperry. Met & Chem Eng 13:469-71 Ag '15

# Specifications

Proposed standard specifications for quenched high-carbon steel splice bars. Ry Age 59:61-2

Specifications for cold drawn steel. Iron Tr R

57:47 Jl 1 '15 Specifications for springs, alloy steel forgings and axles. Ry Age 59:63-4 Jl 9 '15

## Testing

Behavior of iron and steel under compression in tests; abstract. H. Monden. Am Soc M E J 37:721 D '15

J 37:721 D '15
Brinell hardness and tenacity factors of a series of heat-treated special steels; discussion. A. MicWilliam and E. J. Barnes. Met & Chem Eng 13:502-3 Ag '15
Cause of brittleness in soft steel: German tests on a Krupp shock-testing machine, diags Iron Age 94:1322-3 D 3 '14
Change in volume and shape by hardening. Iron Age 95:1399-1402 Je 24 '15
Charpy impact test on treated steels. J. J. Thomas. il Iron Age 96:138-40 Jl 15 '15
Comparison of the properties of a nickel, carbon and manganese steel before and after heat treatment. R. A. Abbott. Am Soc M E J 37:440-2 Ag '15; Same. Iron Tr R 57:22-3 Jl 1 '15; Discussion. Am Soc M E J 37:442-3 Ag '15

Data on nickel steels. G. W. Armstrong. Eng & Contr 44:53-4 Jl 21 '15
Detection of burning in steel. J. E. Stead. il
Iron Tr R 57:843-4 O 28 '15; Abstract. Iron
Age 96:223 Jl 22 '15

Age 96:223 Jl 22 '15

Dynamic properties of steel castings. J. L.
Uhler, il diag Iron Age 96:754-6 S 30 '15;
Same. Iron Tr R 57:630-2 S 30 '15; Same.
Foundry 43:417-19 O '15

Effect of carbon on the physical properties
of heat-treated carbon steel. J. H. Nead. il
Am Inst Min E Bul 108:2341-57 D '15

Effect of titanium alloys on steel. G: F. Comstock. il Iron Tr R 57:391-5+ Ag 16 '15

Effect of various elements in steel on its resistance to corrosion. A. S. Cushman. Eng &
Contr 44:64-5 Jl 28 '15

Finishing temperatures of rails; American society for testing materials committee report.
Iron Tr R 56:1307-9 Je 24 '15; Same. Ry R
57:201-3 Ag 14 '15; Same cond. Iron Age 96:
19-21 Jl 1 '15; Excerpts. Ry Age 59:64-5 Jl

15

19-21 Ji I 13; Excerpts, Ry Age 59:04-9 Ji 9

Fixing the elastic limit standard, T. D. Lynch, il Iron Tr R 57:79-81+ Jl 8 '15

Heat-treatment and testing of shrapnel shells, J. M. Wilson, diags Mach 22:28-31 S '15

Importance of annealing steel castings, Iron Age 96:128-30 Jl 15 '15

Locating the critical range with the Brinell ball tester, J. G. Ayers, jr. Mach 21:282 D '14

Measuring the twisting strength of steel. R. H. Moulton, il Sci Am 112:497 My 29 '15

Micrographic inspection of steel: what the United States navy has done in fixing causes of failures, il Iron Age 95:22-3 F 4 '15

Microscopic tests of steel; German investigations at Krupps, B. Strauss, Iron Age 95: 793-4 Ap 8 '15

New test methods demanded, Iron Tr R 56: 571-2 Mr 18 '15

Steel—Testing—Continued
Novel tests for rail steel, Elec Ry J 46:454 S

Reagent for macroscopic etching. J. L. Jones, il Iron Tr R 56:1303-4 Je 24 '15; Abstract. Eng M 49:919 S '15

ii Iron Tr R 56:1303-4 Je 24 '15; Abstract. Eng M 49:919 S '15
Recent progress in corrosion resistance. D. M. Buck. ii Iron Age 95:1231-4 Je 3 '15; Same. Eng & Contr 43:574-6 Je 30 '15; Same. Iron Tr R 56:1155-8 Je 10 '15; Same. Metal Work 83:879-82 Je 18 '15; Excerpt (Copper steel for resisting corrosion) Eng M 49:762-3 Ag '15; Discussion. A. S. Cushman and others. Iron Age 95:1234-9 Je 3 '15; Same. Iron Tr R 56:1159-63+ Je 10 '15; Same abr. Metal Work 83:882-3 Je 18 '15
Standardization of scleroscope observations. J. J. Ralph. diags Mach 22:52-3 S '15
Stress distributions in engineering materials; report to the British association. Engineer 120:354-5 O 8 '15
Structure and hysteresis loss in medium-carbon steel. F. C. Langenberg and R. G. Webber. il Am Inst Min E Bul 98:291-300 F '15; Same. Iron Age 95:506-8 Mr 4 '15; Same cond. Iron Tr R 57:767-7 S 23 '15
Suggestions regarding the determination of the properties of steel. A. N. Mitinsky. Am Inst Min E Bul 104:1697-1705 Ag '15; Abstract. Iron Age 96:462-3 Ag 26 '15; Same cond. (Proportional limit is prime factor) Iron Tr R 57:1184-6 D 16 '15; Discussion. Am Inst Min E Bul 108:2481-95 D '15
Unsoundness in ladle test ingots. R. W. Hunt. it Iron Tr R 57:1037-9 N 25 '15; Same. Iron Age 96:1303-5 D 2 '15

Steel, Coloring of Carbonia finish, il Am Gas Light J 103:81 Ag 9 '15

9 '15

Steel, Hardening of
Change in volume and shape by hardening.
Iron Age 95:1399-1402 Je 24 '15

Effect of chromium and tungsten upon the hardening and tempering of high-speed tool steel; abstracts, with discussion. C. A. Edwards and H. Kikkawa. Engineer 120:313-14

O 1 '15; Iron Age 96:1126-7 N 11 '15

Effects of quenching mediums. H. V. Wille. il Iron Tr R 57:192-4 J1 8 '15; Same cond. Iron Age 96:190-1 J1 22 '15

Factors in hardening tool steel: abstracts. J: A. Mathews and H. J. Stagg. Elec Ry J 44:1249-50 D 5 '14; Iron Age 94:1340-4 D 10 '14; Mach 21:396-9 Ja '15; Ind Eng 15:58-9

F '15; Rv Age (Mech ed) 89:243-7 My '15; Iron Tr R 57:184-7+ J1 22 '15; Abstract, with discussion. Am Soc M E J 37:141-7 Mr '15

Hardening bevel wheels by special machine. il diag Automobile 32:461 Mr 11 '15

Hardening high speed screw machine tools.

Hardening high speed screw machine tools. R. A. Millholland. Iron Age 96:745 S 30 '15

Hardening of metals. Am Soc M E J 37:489-90 Ag '15

Hardening of steel, J. O. Arnold. Engineer 118: 577 D 18 '14

Recent progress with alloys—theory explaining self-hardening metals including the special steels. L. Guillet. Automobile 31:1118-20 D 17 '14

alt baths for steel hardening; carbonizing and decarbonizing effects of molten salts. E. F. Lake. Mach 21:657-9 Ap '15

Spring forming and hardening machine. il Iron Age 95:1164-5 My 27 '15

See also Case hardening; Steel, Heat treatment of

Steel, Heat treatment of Automatic heat control. E. P. Reichhelm. il Mach 21:304 D '14

Carbon and high-speed steel, H. W. I ridge, Ry Age (Mech ed) 89:472 S '15

Carburization and heat-treatment. J. G. Ayers, jr. il Mach 22:17-23 S '15

harpy impact test on treated steels Thomas, il Iron Age 96:138-40 Jl 15 '15 steels. J. J.

Comparison of the properties of a nickel, carbon and manganese steel before and after heat treatment. R. R. Abbott. Am Soc M E J 37:440-2 Ag '15; Same. Iron Tr R 57:22-3 J1 1 '15; Discussion. Am Soc M E J 37:442-3 Ag '15 Continuous rotary heat-treating furnace. F. M. Paull, il Iron Age 96:569 S 9 '15; Same. Horseless Age 36:234 S 1 '15; Same. Sci Am 113:363 O 23 '15

113:363 O 23°15
Decarbonization of steel in salt baths when heating for hardening. Mach 21:344 D '14
Development of heat treatment. R. R. Abbott. il Sibley J 29:150-6 F '15; Abstract. Met & Chem Eng 13:390-1 Je '15
Developments in the heat treatment of railway gearing; with discussion. W. H. Phillips. il Eng Soc W Pa 30:737-77 N '14; Abstracts. Iron Tr R 55:1134 D 17 '14; Am Soc M E J 37:237-8 Ap '15
Discussion of heat treatment results. H. V.

M E J 37:237-8 Ap '15
Discussion of heat treatment results. H. V. Wille. Iron Tr R 57:986-7 N 18 '15
Effect of carbon on the physical properties of heat-treated carbon steel. J. H. Nead. il Am Inst Min E Bul 108:2341-57 D '15
Electric furnace for reheating, heat treating and annealing. T. F. Baily. Eng Soc W Pa 31:255-72 Ap '15; Same. Met & Chem Eng 13:558-64 S 1 '16; Same cond. Ry Age (Mech ed) 89:481-2 S '15: Discussion. Eng Soc W Pa 31:272-83 Ap '15
Finding the transformation points in steel. E. F. Lake, il Mach 21:711-14 My '15
Flexible heat-treating installation. il diag Iron Age 96:507-10 S 2 '15
Heat-treating plant for forge shop work. il

Flexible heat-treating installation. il diag Iron Age 96:507-10 S 2 '15
Heat-treating plant for forge shop work. il Iron Age 94:1284-6 D 3 '14
Heat-treatment and testing of shrapnel shells.
J. M. Wilson. diags Mach 22:28-31 S '15
Heat treatment in automatic electric furnaces; with discussion. T. F. Baily. Iron Age 96: 993-5 O 28 '15; Same cond. Iron Tr R 57: 833, 856 O 28 '15
Heat treatment of gears. Iron Age 96:629 S 16 '15

Heat treatment of iron and steel in a neutral atmosphere. A. H. White and H. T. Hood, diag Am Gas Light J 103:310-11, 314-15 N 15

Heat treatment of steel; discussion of papers at meeting of American society for testing materials. Iron Age 96:21-2 Jl 1 '15 High speed tool steels. F: C. A. H. Lantsberry. il Iron Age 96:238-41 Jl 29 '15 Modern steels and their heat treatment. R. R. Abbott. il J Fr Inst 179:415-38 Ap '15; Same. Iron Tr R 57:981-6 N 18 '15; Same abr. Iron Age 95:790-2 Ap 8 '15; Abstract, with discussion. Am Soc M E J 37:267-71 My '15 Neglected phenomena in steel treatment. M. E. Leeds. diags Iron Age 96:80-2 Jl 8 '15 Pointers on heat treatment of steel. J. H. Parker, diags Iron Tr R 56:771-4 Ap 15 '15 Practical facts in heat treating steel. R. A. Millholland. Iron Age 95:835-7, 888-9 Ap 15-22 '15

22 '15
Producer gas for heat treating, il diags Iron
Tr R 57:521-3 S 16 '15
Recommended practice for heat-treating casehardened carbon-steel objects. Foundry 43:
102a Mr '15
Recording instruments for heat-treating, il
Automobile 32:460-1 Mr 11 '15
Scientific manufacture of automobile springs,
E. C. Arndts, il Horseless Age 34:921-3 D 23
'14
Steel—its pathology J. F: Schipper il Automobile 32:460-1

Steel—its pathology, J. E; Schipper, il Automobile 32:706-8+ Ap 22 '15

Study of an axle shaft for a motor truck, J; Younger, il diags Am Soc M E J 37:435-9 Ag '15; Same. Iron Tr R 56:1311-14 Je 24 '15; Same cond. Horseless Age 36:142-4 Ag 1 '15; Abstract. Iron Age 96:27 Jl 1 '15; Discussion. Am Soc M E J 37:439-40 Ag '15

Surface decarburization of steel. J. G. Ayers, jr. il Iron Tr R 56:1305-6+ Je 24 '15; Same. Iron Age 96:5-7 Jl 1 '15

Tempering tools with the electric furnace. Ry Age (Mech ed) 89:590 N '15

Tool steel heating forge. il Iron Tr R 56:679 Ap 1 '15

See also Case hardening

See also Case hardening

Steel, Structural teel, Structural
Comparison of carbon steel and high-alloy
steels for bridges. J. A. L. Waddell, Eng &
Contr 41:685-88; Discussion. 41:688-90; 42:
243-4; 495-6 Je 17, S 9, N 25'14
Heat treated and alloy steels. C. D. Young.
Ry Age (Mech ed) 89:13-14 Ja '15
Heat treated and alloy steels for locomotive
parts. Ry Age 57:1129-30 D 18 '14

Steel, Structural—Continucd

How an axle failed in service, il Iron Tr R

56:607-10+ Mr 25 '15

New test methods demanded, Iron Tr R 56:

571-2 Mr 18 '15

Old steel of razed building examined for rust.

Old steel of Fazed building examined for Fust-Ling Rec [5::223-1 Ag 21 7].

Preventing corrosion of steel substructure of the Cortlandt street ferry terminal of the Pennsylvania in New York city with gunite. il Ry Age 58::852 Ap 16 75 Proper painting for steel work. Iron Tr R 55: 1036-7 D 3 '14; Same cond. Eng M 48::758-60

Reciprocating and revolving parts; alloy and heat-treated carbon steel. H. A. F. Campbell. Ry Age (Mech ed) 89:215-16 My '15
Steel for modern motor cars. il Iron Tr R 56: 263-7 F 4 '15; Abstract. Ind Eng 15:57 F '15
Steel for steering knuckles. E. F. Lake. il Iron Tr R 56:611-12+ Mr 25 '15
Steel—its pathology. J. E: Schipper. il diags Automobile 32:796-300 My 6 '15
Surprising failure of steel ship plates. Int Marine Eng 20:50-1 F '15
Use of high-grade alloy steels to reduce weight of locomotives. H. V. Wille. Am Soc M E J 37:31-2 Ja '15

Stee also. Eridges. Itom and steel: Cars.

See also Bridges, Iron and steel; Cars, Steel; Silicon steel; Steel castings; Steel construction; Steel reinforcing bars

### Painting

See Painting, Structural

Steel, Tool. See Tool steel

Steel alloys

Alloy steels. G: L. Norris. Met & Chem Eng 13:739-42 O 15 '15 Alloy steels economical for long-span bridges. J. A. L. Waddell. Eng Rec 72:386-7 S 25

J. A. L. Waddell. Eng Rec 72:386-7 S 25 '15

Development of commercial alloy steels. E. D. Rogers. Iron Age 96:990-3 O 28 '15; Same cond. Iron Tr R 57:839-40+ O 28 '15

Recent progress in corrosion resistance. D. M. Buck. il Iron Age 95:1231-4 Je 3 '15; Same. Eng & Contr 43:574-6 Je 30 '15; Same. Iron Tr R 56:1155-8 Je 10 '15; Same. Metal Work 83:879-82 Je 18 '15; Excerpt (Copper steel for resisting corrosion) Eng M 49:762-3 Ag '15; Discussion. A. S. Cushman and others. Iron Age 95:1234-9 Je 3 '15; Same. Iron Tr R 56:1159-63+ Je 10 '15; Same abr. Metal Work 83:882-3 Je 18 '15

Special steels for track work. W. C. Cushing. Ry Age 59:747-51' O 22 '15; Abstracts. Eng Rec 72:317 S 11 '15; Iron Age 96:692 S 23 '15; Elec Ry J 46:878-9 O 23 '15

Steel—its pathology. J. E; Schipper. il Automobile 32:660-3+ Ap 15 '15

See also Cobalt steel; Manganese steel; Nickel steel; Vanadium steel

Steel balls, See Balls, Steel

Steel belting. See Belting, Steel

Steel bins. See Bins, Steel

Steel bridges. See Bridges, Iron and steel

Steel cars. See Cars, Steel

Steel castings cid open-hearth steel for castings, E. F. Cone. il Iron Age 95:551-3 Mr 11 '15

Castings as electrical apparatus parts. A. B. Reynders. Iron Age 94:1496-7 D 31 '14', Abstract (Holding an electrical manufacturer's business). Foundry 43:96-7 Mr '15

Common sense-steel foundryman's great asset, S. Muntz and S. Roubieu, il Foundry 43: 175-8 My '15; Same, Iron Tr R 57:949-52 N 11 '15

Converter foundry of large capacity, E. F. Cone. il plan Iron Age 96:669-74 S 23 '15

Detroit steel castings company's plant. il plan Iron Age 96:701-6 S 23 '15

Dynamic properties of steel castings. J. L. Uhler. if diag Iron Age 96:754-6 S 30 '15; Same. Iron Tr R 57:630-2 S 30 '15; Same. Foundry 43:417-19 O '15
Electric furnace in the foundry. W: G. Kranz. Am Inst Min E Bul 101:927-30 My '15; Same. Foundry 43:164-5 Ap '15; Same. Iron Age 95:

780-1 Ap 8 '15; Same, Met & Chem Eng 13; 565-6 S 1 '15; Discussion, N. Petinot, Am Inst Min E Bul 108:2507-11 D '15; Same, Met & Chem Eng 13:650 O 1 '15
Electric furnace in the foundry, W. L. Morrison, Iron Tr R 57:177-9 JI 22 '15
Finding costs in the steel foundry, G. Muntz, Iron Tr R 57:482-4 S 9 '15
Heroult furnaces for foundry use, il diags Iron Tr R 56:976-8 My 13 '15; Same, Foundry 43: 225-7 Je '15
How to eliminate defects in steel castings

Tr R 56:976-8 My 13 '15; Same. Foundry 43: 225-7 Je '15
How to eliminate defects in steel castings. J: H. Hall. Foundry 43:146-51 Ap '15; Same. Iron Tr R 57:225-9+ J1 29 '15
Importance of annealing steel castings. Iron Age 96:123-30 J1 15 '15
Iron and steel castings. J: H. Hall. Met & Chem Eng 13:655 O 1 '15
Limitations of the electric furnace in the manufacture of steel castings. E. F. Lake. Met & Chem Eng 13:137-8 Mr '15
Limitations of the electric furnace in the manufacture of steel castings. G. Muntz. Met & Chem Eng 13:108-10 F '15
Manganese-steel castings in the mining industry. W. S. McKee. il diag Am Inst Min E Bul 108:2389-411 D '15; Same. Iron Tr R 57:1077-81 D 2 '15
Production of large steel castings by the baby Bessemer. Iron Age 95:623 Mr 18 '15
Radiography of metals. W. P. Davey, il Am Inst Min E Bul 104:1315-25 Ag '15; Same. Gen Elec R 18:795-800 Ag '15; Same cond. Iron Age 96:522-4 S 2 '15; Abstract. J Fr Inst 180:489-90 O '15
Shrinkage cracks in steel castings. W. R. Bossinger Iron Tr R 57:633 S 30 '15; Same.

180:489-90 O '15 Shrinkage cracks in steel castings. W. R. Bossinger. Iron Tr R 57:633 S 30 '15; Same. Foundry 43:411-12 O '15 Steel casting plant at Oakland, Cal. il Iron Age 95:1387-8 Je 24 '15 Steel foundry sessions of the American foundrymen's association. Iron Age 96:816-18 O 7 '15

7 15
Steel mill castings: use of manganese steel in heavy rolling mill equipment. G: Tripp, il Iron Tr R 56:49-55 Ja 7 15
Study in steel castings. J. H. Whitely. Iron Age 95:541-2 Mr 4 15
X-ray inspection of a steel casting. W. P. Davey. il Gen Elec R 18:25-7 Ja 15; Same. Iron Age 95:186-7 Ja 21 15; Same. Sci Am S 79:84 F 6 15: Same. Eng M 49:106-7 Ap 15; Same. Ry Age (Mech ed) 89:170 Ap 15; Same. Engineer 119:350 Ap 9 15

Sec also Steel ingots; Steel metallurgy

Steel columns. See Columns, Steel

Steel construction

teel construction

Aeroscope a novel feature of Panama-Pacific exposition, il Eng Rec 71:423 Ap 3 '15

Anchored airship: structural amusement device for Panama-Pacific fair weighing 620 tons, il Iron Age 95:184 Ja 21 '15

Chicago municipal pier, il diags Eng N 74:193-7 Jl 29 '15

Covered slip and pier with gantry cranes for handling lumber, diags Eng N 74:494-5 S 9 '15

Derrick mounted on traveling cranes for mill erection at Thane, Alaska. il Eng N 73:127 Ja 21 '15

erection at Thane, Alaska. il Eng N 73:127 Ja 21 '15 Design and construction of the 435-ft. steel framed tower of jewels at the Panama-Paci-fic international exposition. F. S. M. Harris, il diags Eng & Contr 43:47-54 Ja 20 '15; Same cond. Eng N 73:866-72 My 6 '15; Same cond. Eng Rec 71:112-16 Ja 23 '15

Design of 152-foot steel-framed dome. A. W. Earl and T: F. Chace. il diags Eng Rec 70: 451-4, 482-4 O 24-31 '14; Same. Eng & Contr 42:314-20 S 30 '14

Design of steel elevated railways, N. Y. rapid transit system. M. E. Griest, il diags Eng N 73:971-7 My 20 '15

Designing a steel dome for the horticultural palace at the Panama-Pacific international exposition. A. W. Earl and T. F. Chace. diags Eng N 74:208-12 JI 29 '15

Detail and fabrication of Harlem river tubes. T: Duckworth. il diags Eng Soc W Pa 31: 538-60; Discussion. 31:560-83 O '15

Economy in cost and erection of steel building results from cantilever beam design, diags Eng Rec 72:392-3 S 25 '15

Steel construction - Continued

Erecting 40-ton girders at a height of 250 feet above the street, il diags Eng Rec 70: 699-702 D 26 '14

Fireproof ice-house at Lake Hopatcong, diags Eng Rec 71:50-1 Ja 9 '15

Framing of the dome of the palace of horticulture, Panama-Pacific international exposition, A. W. Earl and T. F. Chace, il diags Eng N 74:112-15 Jl 15 '15

Full-load secondary stresses in elevated-railway bents, L. R. Manville, Eng N 74:949-51 N 11 '15

way bents. L. R. Manville. Eng N 74:949-51 N 11 '15
Heavy trusses and foundation girders used in steel bank building, diags Eng Rec 71: 713-14 Je 5 '15
High stresses carried by heavy riveted truss, il diags Eng Rec 72:159 Ag 7 '15
How some problems in the New York elevated improvement work were solved, il diags Eng Rec 71:781-3 Je 19 '15
Interlocking steel construction, il Sci Am 113: 77 Jl 24 '15
Large steel grandstand for automobile racetrack, Sheepshead Bay, N. Y. il Eng N 74: 655 S 30 '15
Octagonal framed dome, San Francisco audi-

Octagonal framed dome, San Francisco auditorium, il diags Eng N 73:773-5 Ap 22 '15 Pressed-steel building construction, il Eng N 73:1098 Je 3 '15

73:1098 Je 3 '15
Rapid construction of additions to steel building; National cloak & suit company. H. E. Muler. il diags Eng Rec 71:404-5 Mr 27 '15
Rapid erection of steel coal breaker. C. S. Phillips. il Eng N 74:1-2 Jl 1 '15
Rapid steel erection on third track work, Second avenue elevated, New York. il diags Eng Rec 71:86-7 Ja 16 '15
Results of recent tests of steel columns presented and discussed. Eng Rec 71:549-50 My

Section of New York elevated rebuilt under heavy traffic without an accident, il map Eng Rec 72:470-2 O 16 15 Special details in reinforced concrete and steel building construction, L. W. Bruck, Eng &

Eng Rec 72:470-2 O 16 '15

Special details in reinforced concrete and steel building construction. L: W. Bruck. Eng & Contr 44:143-4 Ag 25 '15

Stations for third track, New York elevated, placed above existing platforms. il diags Eng Rec 72:138-9 Jl 31 '15

Steel column tests. Eng Rec 71:574 My 8 '15

Steel construction for the Schenley theater, Fittsburgh. C. N. Haggart. diags Eng N 73:658-9 Ap 8 '15

Steel frame for a large electric sign. diags Eng N 73:1071 Je 3 '15

Steel headframe at no. 9 shaft, Republic mine, Vulcan, Mich. F. L. Burr. il diags Eng & Min J 100:379-82, 430-5 S 4-11 '15

Stresses in a rigid frame of two columns and a truss; with table. F. Freyhold. Eng N 73:1031-3 My 27 '15

Structural features of Northwestern-mutual life insurance building, Milwaukee. diags Eng Rec 71:205-7 F 13 '15

Structural steel supports for large steam turbines. diags plan Eng N 73:66-9 Ja 14 '15

Typical and special construction used on Queens extension to New York elevated. il diags Eng Rec 72:76-8 Jl 17 '15

Underrated contributor to steel construction; the detailer. R. Fleming. Eng N 74:653-4 S 30 '15

Wind stresses in steel mill-buildings. R. Fleming, diags Eng Re N 73:210-14 F 4 '15

Wind stresses in steel mill-buildings, R. Fleming, diags Eng N 73:210-14 F 4 '15
Wind stresses in the steel frames of office buildings, A. Smith, tables pls W Soc E J 20:341-64 Ap '15
Wind stresses in the steel frames of office buildings, W. M. Wilson and G. A. Maney, tables Ill U Eng Exp Sta Bul 80:1-88 '15; Abstract, Eng Rec 72:231-2 Ag 21 '15
Wind stresses in the steel frames of office buildings; with discussion, W. M. Wilson, tables pls W Soc E J 20:365-90 Ap '15

See also Bridges, Iron and steel; Building; Cars, Steel; Concrete construction; Corrosion and anti-corrosives; Elevated railroads; Girders; High buildings; Hoisting machinery; Office buildings; Painting, Structural; Strains and stresses; Strength of materials; Towers, Steel

Steel cutting

Special hardie cuts 20-inch steel pipe quickly. H. F. Johnston. Eng Rec 71:469 Ap 10 '15

Steel hardening. See Steel, Hardening of

Steel houses. See Houses, Steel

Steel houses. See Houses, Steel
Steel industry and trade
Billet prices for twenty-nine years. Iron Age
95:12 Ja 7 '15
British India. U S Sp Cons Rep 72:205-14 '15
British iron and steel trade in 1914. Iron Age
95:144-5 Ja 14 '15
British steel and American competition. Engineer 118:602 D 25 '14
Cambria steel company report for year ended
December 31, 1914. Iron Age 95:356-7 F 11
'15
Canada's reduced imports. Iron Age 96:364-5

Canada's reduced imports. Iron Age 96:364-5 Ag 12 '15 Carnegie steel co. warehouse opens at Boston il plan Iron Tr R 56:620-2 Mr 25 '15 Carnegie steel company's Boston warehouse, at Allston, Mass. il Iron Age 95:670-2 Mr 25

Charts showing fluctuations in iron and steel prices for twenty years. Iron Tr R 56:8a Ja

Distribution of steel. Met & Chem Eng 13: 270-1 My '15 Electric steel industry's present status. Iron Age 95:94-8 Ja 7 '15 European iron and steel in 1914. Eng & Min J 99:269-70 F 6 '15 Ford will build furnaces. Iron Tr R 56:1297 Je 24 '15

24 '15
French steel plants in war time. F. Miltoun, Iron Age 95:940-2 Ap 29 '15
Full text of decision in the United States district court for the district of New Jersey. Iron Tr R 56:1171-1218 Je 10 '15
Future of Germany's steel industry. H. H. Campbell. Iron Age 96:188-9 Jl 22 '15
Gain of ten furnaces. Iron Age 95:1306-7 Je 10 '15

10 15 International steel trade situation. Engineer 119:283-4 Mr 19 15 Iron and steel prices for seventeen years. Iron Age 95:16-17 Ja 7 15 Iron and steel statistics. F; Hobart. Eng & Min J 99:70-1 Ja 9 15 Iron and steel wages and hours. Iron Age 95: 1265 Le 2 15

Iron and steel wages and hours. Iron Age 95: 1265 Je 3 '15
Iron, steel and coal in Dixie. H. S. Chamberlain. Iron Tr R 56:176-8+ Ja 21 '15
New finance for steel and iron: how the new federal reserve system can be utilized. I: F. Marcosson. Iron Tr R 56:9-15 Ja 7 '15
New German steel syndicate. Iron Age 95:595
Mr 11 '15
Pittsburgh iron and steel markets. B. E. V. Luty. map Eng & Min J 99:72-3 Ja 9 '15
Production of steel ingots, castings and finished materials in 1914. Iron Tr R 57:325 Ag 12 '15
Progress in the iron and steel industry and

the electric furnace. K. G. Frank. Am Inst E E Pro 34:2547-54 O '15
Railroads place orders with Canadian company. Iron Tr R 56:542-3, 578-80 Mr 18 '15
Railways and the steel companies. Ry Age 58:682 Mr 26 '15
Retailing steel mill products, il Iron Tr R 56: 65-71 Ja 7 '15
Some aspects of the iron and steel industry in Europe. U S Sp Cons Rep 71:1-48 '15
Steadying effect of carrying stocks. Iron Age 94:1498 D 31 '14
Steel industry and a year of war. E. Schrödter. Iron Age 96:628-9 S 16 '15; Same. Sci Am S 80:298 N 6 '15
Steel industry and export trade. H. H. Campbell. Eng M 49:167-73 My '15
Steel industry and the war. Met & Chem Eng 13:466-7 Ag '15
Steel production in 1914. Iron Age 96:367-8 Ag

Steel production in 1914. Iron Age 96:367-8 Ag 12 '15

Steel production in the United States, 1914. Eng & Min J 100:283 Ag 14 '15 Steel statistics for 1914. Eng & Min J 99:1072

Je 19

Steel trade and the war. E. T. Good. Iron Tr R 56:101-2 Ja 7 '15 Steel trade's poor year. Met & Chem Eng 13: 7 Ja '15

Survey of events in England: effects of the great war on iron and steel. J. Horton, Iron Tr R 56:54-6, 82 Ja 7 '15

teel industry and trade—Tontinued
Under-advertising of the steel business. G: H.
Jones. Eng M 50:357-63 D '15; Same cond.
Iron Age 96:1025-7 O 28 '15
United States steel corporation wins its suit.
Iron Age 95:1299-1301+ Je 10 '15
Wages and hours of labor in the iron and steel industry, table Mach 21:954 Ag '15
War and the export trade, C. J. Stark. Iron
Tr R 56:31-2, 90-4 Ja 7 '15
Warehouse business requires speed, il Iron
Tr R 57:578-9 S 23 '15
Why tool steel prices have gone up. E. C,
Kreutzberg, Iron Tr R 57:987 N 18 '15

\*\*New also Iron industry and trade; Rolling
intelligible industry und trade; Rolling
teel ingots

Aluminum as a check to sulphide segregation in steel ingots. Iron Age 96:130 Jl 15 '15 Bottom plates for pouring ingots. R. H. Irons. il Iron Age 96:1221-2 N 25 '15

il Iron Age 96:1221-2 N 25 '15
Commercial production of sound, homogeneous steel ingots and blooms. E. Gathmann. il diags Am Inst Min E Bul 104:1485-92 Ag '15; Same cond. Iron Age 96:310-11 Ag 5 '15; Same abr. Iron Tr R 57:305-6 Ag 12 '15; Discussion. Am Inst Min E Bul 108:2511-12 D '15

Discussion. Am Inst Min E Bul 108:2511-12
D'15
Control of piping and segregation in ingots.
H: M. Howe. it Iron Age 96:995-9; Discussion. E. F. Kenney. 96:999-1000 O 28 '15
Displaced volume and power in rolling mills.
F. Denk. Iron Age 96:283-90 Ag 5 '15
How sulphides may exist in steel ingots. J. O. Arnold and G. R. Bolsover. Iron Tr R 57:
377-8 O 14 '15; Discussion. G; F. Comstock. Iron Tr R 57:894+ N 4 '15
Ingot mold with a vacuum chamber. diags Iron Age 95:1171 My 27 '15
Is duplexing slated for assassination? J. I. Peyton. il Met & Chem Eng 13:397 Je '15
Making sound steel commercially. E: F. Kenney. il diags Iron Tr R 57:39-55+, 397-400
Ag 19-26 '15; Same (pt 2). Iron Age 95:1343-6 Je 17 '15; Discussion. H: M. Howe. Iron Tr R 57:400+ Ag 26 '15
Mechanical elimination of seams in steel products, notably steel rails. R. W. Hunt. Iron Age 94:1334-7 D 10 '14; Same. Iron Tr R 55: 1073-6 D 10 '14; Same. Sci Am S 79:100-1 F 13 '15; Same cond. Eng N 72:1228-31 D 17 '14; Same cond. Eng Rec 70:636 D 12 '14; Same cond. Ry Age 57:1055-7 D 4 '14; Same cond. Ry Age 57:1055-7 D 4 '14; Same cond. Ry Age 57:1055-7 D 4 '14; Same cond. Ry R 56:85-8 Ja 16 '15; Same cond. Eng M 48:755-7 F '15; Discussion. Iron Age 94:1337-8
D 10 '14
Methods of preventing piping in steel ingots; abstract. E. Gathmann. diag Met & Chem

D 10 '14
Methods of preventing piping in steel ingots;
abstract. E. Gathmann. diag Met & Chem
Eng 13:656 O 1 '15
Eng 13:e56 o graph furnace, il diags Engineer

aostract. E. Gathmann. diag Met & Chem Eng 13:656 O 1 '15
New ingot heating furnace, il diags Engineer 120:162-4 Ag 13 '15 Non-conducting sinkhead for ingot molds. diag Iron Age 96:195 Jl 22 '15
Sound steel for rails and structural purposes, R. A. Hadfield. il J Fr Inst 179:119-40, 663-80 F, Je '15
Sound steel ingots and rails. G: K. Burgess and R. A. Hadfield. il Am Inst Min E Bul 98: 455-68 F '15; Same. Iron Age 96:346-8 F 11 '15; Same Iron Tr R 56:369-72 F 18 '15; Same cond. Ry R 56:362-4 Mr 13 '15; Discussion. Am Inst Min E Bul 101:1112-15 My '15; Discussion. Am Inst Min E Bul 101:1112-15 My '15; Discussion. Met & Chem Eng 13:445-6 Jl '15 Unsoundness in ladle test ingots. -R. W. Hunt. il Iron Tr R 57:1037-9 N 25 '15; Same. Iron Age 96:1303-5 D 2 '15

eel metallurgy eel metallurgy
Acid open-hearth steel for castings. E. F.
Cone. il Iron Age 95:551-3 Mr 11 '15
Tomparative furnace efficiency. R. J. Weitlaner,
Met & Chem Eng 13:357-61 Je '15
Conserving the manganese in pig iron in
making steel. Iron Age 96:930 O 21 '15
Contributions of the chemist to the iron and
steel industry. A. S. Cushman. J Ind & Eng
Chem 7:934-5 N '15
Contributions of the chemist to the steel industry. G: W. Sargent. J Ind & Eng Chem
7:932-4 N '15

Cost of electric furnace steel; experience with the Snyder furnace. F. T. Snyder. il diag Iron Age 96:926-8 O 21 '15

Duplex process of steel manufacture at the Maryland steel works. F. F. Lines. diagsplan Am Inst Min E Bul 100:679-94 Ap '15; Same. Iron Age 95:730-3 Ap 1 '15; Same. Iron Tr R 56:675-9+ Ap 1 '15; Effect of titanium alloys on steel. G: F. Comstock. il Iron Tr R 57:391-5+ Ag 26 '15 Electric furnace steels for dynamic stresses. J. E: Schipper. il diags Automobile 33:865-9 N 11 '15

Electric steel. F. T. Snyder. il diags Iron Tr R 55:1077-82+, 1127-30+ D 10-17 '14

Electric steel direct from ore fines. A. C. Dalton. Iron Age 96:1184-5 N 18 '15

Electric steel durnace of new design; the Wile arc type. R. S. Wile, il diags Iron Age 96:866-8 O 14 '15

Electrical steel by the acid process; abstract. A. Müller. Met & Chem Eng 13:640 S 15 '15

Electrometallurgical industries as possible consumers of electric power. D. A. Lyon and R. M. Keeney. Am Inst Min E Bul 104:1707-30 Ag '15; Excerpts. Iron Age 96:360-2 Ag 12 '15; Discussion. Am Inst Min E Bul 108: 2502-7 D '15

Furnace for making steel from ore. diags Iron Tr R 57:743+ O 14 '15

2502-7 D '15

Furnace for making steet from ore. diags Iron Tr R 57:743+ O 14 '15

Improved laboratory furnace. C: M. Johnson. ii Iron Tr R 56:613-14 Mr 25 '15

Is duplexing slated for assassination? J. I Peyton. il Met & Chem Eng 13:397 Je '15

Making sound steel commercially. E: F. Kenney. il diags Iron Tr R 57:349-55+, 397-400

Ag 19-26 '15; Same (pt 2). Iron Age 95:1343-6

Je 17 '15; Discussion. H; M. Howe. Iron Tr R 57:400+ Ag 26 '15

Making steel by electricity, diags Sci Am S 79:206-7 Mr 27 '15

Making steel by the duplex process S. S.

Making steel by the duplex process. S. S. Martin, diags Iron Age 95:75-8 Ja 7 '15

Manufacture of electric steel in the Sto furnace, V: Stobie. Engineer 119:616-17

Occurrence and influence of nitrogen on iron and steel; abstract and discussion. N. Tschischewski. Iron Age 96:952-4 O 21 '15; Engineer 120:334-5 O 8 '15

Open hearth versus the electric furnace in the manufacture of commercial steels. S. nell. Met & Chem Eng 13:630-1 S 15 '15

Plant of the duplex process for making steel. J. K. Furst. diags plans Am Inst Min E Bul 94:2493-514 O '14'; Same cond. Iron Age 94:882-6 O 15 '14: Discussion. Am Inst Min E Bul 100:810-12 Ap '15

Steel making in the electric furnace. J. H. Gray. Iron Age 96:1238-9 N 25 '15; Excerpts. Met & Chem Eng 13:656-7 O 1 '15

Technical progress in iron and steel in 1914. J. E. Johnson, jr. Iron Age 95:19-23 Ja 7 '15 See also Bessemer process; Iron metallurgy; Metallurgy; Open hearth process; Rolling mills: Steel, Hardening of; Steel, Heat treatment of; Steel castings; Steel industry; Steel ingots; Steel works

### Exhibitions

Steel making in tablet form; wall panel il Iron Age 96:416 Ag 19 '15 Steel painting. See Painting, Structural

Steel pipes. See Pipes, Steel

Steel plates. See Plates, Iron and steel

Steel poles. See Poles, Steel

Steel rails. See Rails

Steel reinforcing bars
Designing of reinforced concrete beams; some
data tending to show errors in present theory
and practice. L. J. Mensch. Eng & Contr
44:108-11 Ag 11 '15

How design and methods of buying influence the cost of steel reinforcing bars. A. D. Mellor. Concrete Cem 6:184-5 Ap '15

Tests for bond and electrolytic corrosion of painted reinforcing steel; abstract. H. A. Gardner. il Eng N 73:136-7 Ja 21 '15

U-bolt splice in heavy reinforcing bars. T: C. Atwood. diags Eng N 73:218 F 4 '15 Sce also Concrete, Reinforced

Steel square. See Square (instrument)

Steel storage

New steel warehouse of Joseph T. Ryerson & son, Jersey City. il Iron Age 96:298-9 Ag 5 '15; Iron Tr R 57:270-1 Ag 5 '15

Steel tape

History of steel tapes. Eng N 72:1316-17 D 31

Steel-tape repairs, il Eng N 73:1130-1 Je 10 '15; Same cond. Eng & Min J 100:59-60 Jl 15; , 5 15, 15

Steel ties. See Railroad ties, Steel

Steel towers. See Towers, Steel

Steel works

Alternating-current controllers for steel mills. A. Simon, il diags Am Inst E E Pro 34:731-51 My '15; Same. Iron Tr R 57:477-81+, 527-9 S 9-16 '15; Abstract. Elec W 65:1199-6 My

S 9-16 '15; Abstract. Elec W 65:1195-6 My 8 '15
Apprentice work in steel plants. B. W. Gilson. Iron Tr R 55:1138+ D 17 '14
Association of iron and steel electrical engineers 9th annual convention. Elec R & W Elec'n 67:521-4 S 18 '15
Blast-furnace plant auxiliaries and general arrangement. J. E. Johnson, jr. plans Met & Chem Eng 13:495-9 Ag '15
Design features of the open hearth building of the Pennsylvania steel co., Steelton, Pa. diags plans Eng & Contr 42:602-4 D 30 '14
Development of the merchant rolling mill. J. R. George. il diags Iron Tr R 56:1125-8+ Je 3 '15; Same. Iron Age 95:1282-6 Je 10 '15
Duplex process of steel manufacture at the Maryland steel works. F. F. Lines. diags plan Am Inst Min E Bul 100:679-94 Ap '15; Same. Iron Age 95:730-3 Ap 1 '15; Same. Iron Tr R 56:675-9+ Ap 1 '15
Engines and rolling mills in steel works of the Brier Hill steel co., Youngstown, O. il Engines

Iron Tr R 56:675-9+ Ap 1 '15
Engines and rolling mills in steel works of the Brier Hill steel co., Youngstown, O. il Engineer 119:229-30 Mr 5 '15
Galveston Carnegie warehouse. E. C. Kreutzberg. il Iron Tr R 56:169-70+ Ja 21 '15
Gas and steam engines and the turbine. J. E. Johnson, jr. Iron Age 95:626-9 Mr 18 '15;
Same. Sci Am S 79:294-5 My 8 '15
Germany's grip on French steel works. E. Schrödter. Eng M 49:733-4 Ag '15
Heating an open-hearth furnace by tar. A. Greiner, Iron Age 95:1072-3 My 13 '15;
Same. Iron Tr R 56:1017-18 My 20 '15
Homestead repair shops. il plan Iron Tr R 56:659-65 Ap 1 '15
How to select your prime mover. G. Fisk. Iron Tr R 57:569-72+ S 23 '15
Industrial growth in the Cleveland district: new metal-working plants. Iron Age 95:98-9 Ja 7 '15
Low-pressure turbines in steel mills. F. G.

Industrial growth in the Cleveland district: new metal-working plants. Iron Age 95:98-9 Ja 7 '15

Low-pressure turbines in steel mills. F. G. Cutler, Power 40:827-8 D 8 '14

Mill controllers. H. F. Stratton. Am Inst E E Pro 34:599-614 Ap '15; Same. Iron Tr R 56: 820-4 Ap 22 '15; Abstract, with discussion. Elec R & W Elec'n 66:778-80 Ap 24 '15; Discussion. Am Inst E E Pro 34:2869-94 N '15

Modern steel plant at Massilon. il diags plan Iron Tr R 56:83-7 Ja 7 '15

New iron and steel works construction. Iron Age 95:30-2 Ja 7 '15

Newcastle steel works, New South Wales. il Engineer 120:223-4, 226 S 3 '15

Pennsylvania's rail and structural mill at Steelton. il plan Iron Age 96:617-22 S 16 '15

Plant of the duplex process for making steel. J. K. Furst. diags plans Am Inst Min E Bul 94:2493-514 O '14; Same cond. Iron Age 94: 882-6 O 15 '14; Discussion. Am Inst Min E Bul 100:810-12 Ap '15

Purchased power for the steel mill; economic advantages of central station current. C. S. Lankton. Iron Tr R 57:573-5 S 23 '15

Resicza steel works, a likely war goal. il Iron Age 96:516-18 S 2 '15

Rush work at Minnesota steel plant, Duluth. il Iron Tr R 57:556-8 S 23 '15

Sheet bar and special steel plant: Central steel company, Massilon, Ohio. il diags plans Iron Age 95:52-5 Ja 7 '15

Sheet bar and special steel plant: Central steel company, Massilon, Ohio. il diags plans Iron Age 95:52-5 Ja 7 '15

Sheet bar and special steel plant: Central steel company of European iron and steel works. J. Pennell. Iron Tr R 56:57-64 Ja 7 '15

Steel plant in southern California; oi-burning open-hearth furnace. il Iron Age 95:1110-12 My 20 '15

Steel plant repair system, B. D. Quarrie. Iron Age 94:1316-17 D 3 '14 Trumbull steel co. doubles capacity of sheet plant. R. V. Sawhill, il Iron Tr R 56:321-5+ F 11 '15

Waste-heat boilers in steel plants, C. J. Bacon, diags Iron Age 95:1349-52 Je 17 '15; Abstract, Iron Tr R 56:1123-4 Je 3 '15 Water-cooled equipment for sheet mills. il diags Iron Age 95:441-3 F 25 '15

See also Rolling mills

Steeples. See Towers

Stefánsson, Vilhjálmur, 1879-Stefánsson's new found land. H. ; il map Sci Am 113:289+ O 2 '15 Steinmetz, Charles Proteus, 1865-J. Spinden.

Next president of Illuminating engineering society, por Elec W 65:1572-3 Je 12 '15 Portrait. Elec R & W Elec'n 66:1135 Je 12 '15

Brazing stellite to machine steel. Mach 21:421 Ja '15 Stellite,

tellite, a cobalt-chromium alloy of great hardness. E. Haynes. Eng & Min J 100:711 O 30 '15

Stencils and stenciling

Outgrowths of letterpress; stenciled and applique pennants. G: Sherman. il Inland Ptr 55:177-82 My '15

Stereochemistry

Interpretations of some stereochemical prob-lems in terms of the electronic conception of positive and negative valences. H. S. Fry Am Chem Soc J 37:855-92 Ap '15 See also Atoms; Chemistry, Physical

Stereopticon

Novel dissolving picture-projecting apparatus R. G. Skerrett. il Sci Am 112:612 Je 19 '15

Stereoscopic telemeter
Measurement of distances in war. A. Keller
il diags Sci Am S 79:324-5 My 22 '15

Stereoscopic views
Anaglyphs, Sci Am 113:68 JI 17 '15
Superposed stereoscopic pictures that need no stereoscope. Sci Am 113:210 S 4 '15

Stereotyping Rivett flong machine. A. W. Birdsall. il In land Ptr 55:95-6 Ap '15 Syndicate stereotyping. A. W. Birdsall. Inland Ptr 54:360 D '14

See also Electrotyping

Stevens bill

Bill for block signals, automatic stops, stee cars, headlights and investigations. Ry R 56 125-7 Ja 23 '15

Stevens institute of technology
Contributions of Stevens tech to the wel
fare and progress of the country. F. D. Fur
man. Stevens Ind 32:31-47 Ja '15
Stevens in history. J. H. Cuntz. Stevens In
32:19-30 Ja '15

Student life at Stevens. R. F. Homhan. Stevens Ind 32:57-63 Ja '15

Stillman, Thomas Bliss, 1852-1915 Sketch. F. J. Pond. por J Ind & Eng Cher 7:804-5 S '15

Stills. See Distillation

Stock cars

End construction of Canadian Pacific stoc cars, diags Ry Age (Mech ed) 89:29-30 Ja '1. Thirty-ton stock car for the Canadian Pacifi Ry. R. W. Burnett, il diag Ry R 55:686-7 D '14

Stock yards

See also Chicago-Stock yards

Stockings. See Hosiery

Stockpile trestle of wood. O. Gustafson, il diag see Eng & Min J 98:1003-4 D 5 '14

Stockroom records

Handling stock by systematic methods. il Met Work 82:810-12 D 18 '14

Stocks Discount on stock. S. Walton, J Account 20 238-41 S '15 238-41 S '15 Treasury stock, S. Walton, J Account 19:392. My '15 Stokers, Mechanical

Automatic chain grate stokers, il diags Eng M 50/sup5-7 O '15/ Elee W 66/1106 N 13 '15 Characteristics of automatic stokers, R. J. S. Piggott, Ind Eng 15/13-14 Ja '15 Cell and air regulation with stokers, W. D. Lewis. Power 42/693 N 16 '15 Coking coal chain stoker, il Iron Age 95/1280-1 Je 10 '15 Comparative tests of stoker- and hand-fired boilers, H. S. Knowlton, il Power 41/300-1 Mr 2 '15

Mr 2 '15 Hanna locomotive stoker, il diags Ry R 56: 770-1 Je 5 '15

T70-1 Je 5 '15
Kokomo underfeed stoker, il diags Power 42: 195 Ag 10 '15
Locomotive boiler design and mechanical stokers. Engineer 120:156 Ag 13 '15
Locomotive stokers: American railway master mechanics' association committee report. Ry R 56:807 Je 12 '15
Mechanical freman; Kincaid stoker, il diag Colliery 36:109-10 S '15
Mechanical stokers; committee report of International railway fuel association, Ry Age 58:1113-14 My 28 '15; Same, Ry Age (Mechanical stokers for locomotives. Power 41: 827 Je 15 '15
Mechanical stokers on American locomotives.

827 Je 15 '15 Mechanical stokers on American locomotives. Engineer 119:42-3, 60-1, 116-17, 163 Ja 8-15, 29, F 12 '15

29, F 12 '15 Mechanical stoking of locomotives; with dis-cussion, W. S. Bartholomew, il diags J Fr Inst 180:253-310 S '15 New Kincaid stoker, il diag Power 41:42-3 Ja 12 '15

12 '15 Nosmoke chain-grate stoker, il diags Power 42:19-20 JI 6 '15 Reducing costs with mechanical stokers, C. C. Brinley, il Eng M 50:276-92 N '15 Relation of mechanical stokers to the fuel problem, Ry R 56:700-1 My 22 '15 Side-feed stokers, O. Monnett, diags Power 40:802-4 D 8 '14 Stationary boiler stoker, il Iron Age 95:136 Ja 14 '15

14 '15
Stoker for scientific firing, il Iron Tr R 56: 127+ Ja 14 '15
Tests on a recent type of chain grate stoker and new method of baffling Stirling boilers. J: A. Hunter. diags Eng Soc W Pa 31:1-10; Discussion. 31:10-55 F '15; Abstract. Am Soc M E J 37:348-51 Je '15
Traveling-grate stoker with revolving disk grate bars, il Elec W 66:487 Ag 28 '15

Underfeed stoker, il Elec W 65:950 Ap 10 '15 Underfeed stokers. J: Van Brunt, diag Power 41:132 Ja 26 '15

Underfeed stokers, O. Monnett, diags Power  $40:838-40~\mathrm{D}~15~'14$ 

Westinghouse underfeed stoker, il diags Power 40:841-2 D 15 '14

What the stoker has done for the locomotive: discussion. C. F. Street. Ry R 56:69 Ja 9 '15; Same. Ry Age 58:59 Ja 8 '15; Same cond. Am Soc M E J 37:32-3 Ja '15; Same cond. Ry Age (Mech ed) 89:11 Ja '15

What the stoker has done for the locomotive: discussion. E. A. Averill. Ry Age 58:59-61 Ja 8 '15; Same cond. Am Soc M E J 37:33-4 Ja '15; Same cond. Ry Age (Mech ed) 89:11-12 Ja '15

Itakolumite, a flexible stone. Sci Am 112:312 Ap 3 '15

Removing stains from stonework, Bldg Age 37:41 My '15

See also Building stones; Granite; Lime-stone; Quarries and quarrying

tone, Concrete. See Concrete stone

tone bridges. See Bridges, Stone

tone lands United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94;pt 2, 1308-33 '15

tone pavements. See Pavements, Stone

topcocks Street stop-cock of the Boston water-works department. G: H. Finneran, diags Eng N 73:77 Ja 14 '15 Vacuum and pressure stopcocks. M. Randall and F. R. v. Bichowsky, diags Am Chem Soc J 37:137-44 Ja '15

Stoping methods. See Mining engineering

Storage. See Stores systems

Storage batteries

torage batteries
A. C. service from battery, J. A. Walton, diags
Elec W 66:975-6 O 30 '15
Battery-exchange service in Boston, Elec R &
W Elec'n 67:105 Jl 17 '15
Battery reserve in an alternating-current system, diags Elec W 66:465-6 Ag 28 '15
Dry storage battery, il Elec R & W Elec'n
67:682-3 O 9 '15
Edison storage battery ruggedness, il Elec R
& W Elec'n 67:646+ O 2 '15
Edison submarine boat storage battery, H, T,
Wade, il Sci Am 112:450+ My 15 '15
Effect of porosity on the output of storage
batteries; abstract, C, Heim, Elec W 66:600
S 11 '15 S 11

S 11 '15
Information on storage battery care. diag Automobile 32:671-2 Ap 15 '15
Low-gravity cutout for storage battery. W: E. Dixon. diag Power 41:720 My 25 '15
Modern submarines in war and peace. S. Lake. Int Marine Eng 20:502-3 N '15
Nickel-iron-alkaline cells for high-dischargerate and submarine service. il diag Elec W 66:1103-4 N 13 '15
Smashing noint of storage battery. Elec R &

rate and submarine service. Il diag Elec W 66:1103-4 N 13 '15
Smashing point of storage battery. Elec R & W Elec'n 66:79 Ja 9 '15
Smelting storage-battery sediment, W. C. Smith. Eng & Min J 100:18 Jl 3 '15
Storage batteries for handling peak loads. E. Brown. Power 41:470-1 Ap 6 '15
Storage batteries for radio service. Elec R & W Elec'n 66:352 F 20 '15
Storage battery for electric plants. J. F. Springer. il Munic J 37:915-17 D 24 '14
Storage battery serving combined alternating-current and direct-current system. il plan Elec W 65:1305-6 My 22 '15
Storage-battery voltage regulation. C. S. Redding, il diags Elec W 65:13134-5 My 1 '15
Submarine power plant. A. Hoar. il Sibley J 30:59-63 N '15
Unused storage battery should have care. Au-

Unused storage battery should have care. Automobile 32:716-17 Ap 22 '15

Sec also Electric batteries

## Bibliography

List of works relating to storage batteries, 1900-1915, G: S. Maynard, N Y Pub Lib Bul 19:365-407 Ap '15

### Charging

Auxiliary equipment for charging one to twenty cells, il diag Elec W 65:169 Ja 16 '15 Charging batteries from 120-volt circuit, Horseless Age 35:30 Ja 6 '15 Charging small storage batteries, G. E. Miles diags Power 41:757 Je 1 '15 Constant-potential charging system effects saving in Chicago garage, il Elec W 65: 865-6 Ap 3 '15 Constant-potential charging system in Chicago garage.

S65-6 Ap 3 '15
Constant-potential charging system in Chicago, il Elec R & W Elec'n 66:277-8+ F 6 '15
Construction of a vibrating rectifier for charging automobile ignition batteries. G: Fraasa. diags Sci Am S 80:108-9 Ag 14 '15
Control-board for series-parallel battery charging, il Elec R & W Elec'n 67:686 O 9 '15

'15
Electric charging equipment in the new plant of the Ward bread company, Boston. il Elec R & W Elec'n 66:58+ Ja 2 '15
Home-made charging panel for small batteries, il Elec W 66:591-2 S 11 '15
How to pick the positive for battery charging. F. I. Hoffman. Horseless Age 36:278+ S 15 '15

Large charging installation for Cambridge (Mass.) bakery, il Elec W 65:239 Ja 23 '15

Low-voltage battery-charging device. il diag Elec W 65:437 F 13 '15

Small battery-charging outfits for automobile ignition and lighting batteries. il Elec R & W Elec'n 67:300-1 Ag 14 '15; Elec W 66:422-3 Ag 21 '15

Small mercury-vapor rectifier for charging automobile lighting batteries, il Elec R & W Elec'n 66:1010 My 29 '15

Storage batteries—Charging—Continued
Storage battery charging—magnet recharging.
P. M. Heldt. il diags Horseless Age 35:4426 Mr 31 '15

Winding for magnet chargers—charging storage batteries. Horseless Age 35:143 Ja 27 '15

### Manufacture

Lead poisoning in manufacture of storage batteries; abstracts. A. Hamilton, Horseless Age 35:480 Ap 7 '15; Elec R & W Elec'n 66:1056 Je 5 '15; Eng M 49:442 Je '15

Storage battery cars. See Motor cars (railroad)
—Storage battery

Storage battery locomotives. See Electric locomotives

### Storage racks

Making rack for storage of sheet metal. diags Metal Work 83:313-14 F 26 '15 Miscellaneous stands for use in the foundry. A. Hill. diags Foundry 43:301-3 Ag '15 System of flexible, fireproof storage racks, il Ind Eng 14:417 N '14

### Store fronts

Store front of Hanan & son, Boston. il plan Arch & Bldg 47:144-7 Ap '15

### Stores

Group of village stores at Chatham, Mass.; views and plans. Brickb 24:259-60 O '15 See also Department stores; Store fronts

Stores, Cooperative. See Cooperation

Stores, Cooperative. See Cooperation

Stores systems

Efficiency in the stores department. W. G.
Astle. il Elec Ry J 46:906-10 0 30 '15

Part number system for manufacturers. C. E.
Fairbanks. Ind Eng 15:15-16 Ja '15

Perpetual inventory in practical stores operation. J. B. Green. Eng M 48:879-88 Mr '15

Positive identification of tool steels. Iron Age 96:200 Jl 22 '15

Precedent versus progress in the stores department. G: G. Yeomans. Ry Age 59:237-8 Ag 6 '15

Railroading from a general storekeeper's point of view. J. G. Stuart. Ry R 57:700-2 N 27 '15 Signal and supply departments. C. R. Ahrens; R. D. Long; A. G. Shaver. Ry R 57:120-4 Jl 24 '15

24 '15
Storeroom organization and management; mnemonic symbolizing. W. G. Astle. il Iron Age 96:457-60 Ag 26 '15; Same. Metal Work 84: 332-4 S 10 '15
System in a factory stock department. G. H. Culver, il Eng M 49:174-83 My '15
Systematic purchase and care of mill supplies. E. C. Church. Textile World 49:207-9 My '15

See also Pattern storage; Storage racks

Storm King highway Storm King highway, New York, H. E. Breed, il map Eng N 74:721-4 O 14 '15

# Storms

Cincinnati buildings suffer from wind storm. C. M. Stegner, il map Eng N 74:140-2 Jl 15'15 See also Hurricanes; Rain; Thunderstorms; also Galveston, Texas—Hurricane, 1915; New Orleans—Hurricane, 1915

Stove founders' national defense association Annual meeting, New York city, May 11. Metal Work 83:744 My 21 '15

Stove manufacturers, National association of. See National association of stove manufacturers

Stove plates
Grinding and polishing stove plate trimmings.
F. W. Hobbs Foundry 43:236-7 Je '15

Cooking and heating stoves in foreign countries. U S Sp Cons Rep 63:1-63 '14
First American heating stove, diag Am Gas
Light J 103:33 Jl 19 '15

Heating systems in the United Kingdom; open-grate fire vies with coal and wood stove. Metal Work 83:697-8 My 14 '15 wood

Lecture on stoves. W: H. Perkins. Metal Work 82:801 D 18 '14

Stove trade to honor Benjamin Franklin. il Metal Work 84:88-9 Jl 16 '15

Stoves in Argentina. Metal Work 83:536 Ap 9

Test on melting shot iron in the cupola: experiment in a stove foundry. G. E. Pickup, il Foundry 42:467-8 D '14

See also Electric stoves; Gas stoves; Heat-

Stoves, Blast furnace. See Blast furnace stoves

Straightening
Cold straightening of rails, R. W. Hunt. Ry
Age 59:726 O 22 '15

Straightening a tall leaning factory chimney by a new method. T: S. Clark, diags Eng N 73: 266-7 F 11 '15

## Straightening machines

Axle and armature-shaft straightener. J. N. Graham, diags Elec Ry J 46:238-9 Ag 7 '15 One pass straightening machine, il Iron Tr R 56:919 My 6 '15

# Strainers

Motor-operated twin strainer. il Power 41:8-9 Ja 5 '15

### Strainometers

Universal strainometer of simple design. S. H. Graf. il Iron Age 96:134-5 Jl 15 '15

Strains and stresses
Allowing for impact in bridge calculations.
J. D. W. Ball, diags Engineer 120:151-3 Ag 13

Analysis of stresses in Chicago elevated steel car. H. A. Johnson, diag Elec Ry J 44:1299-1300 D 12 '14
Behaviour of metals under stress. F. C. A. H. Lantsberry, Engineer 119:68 Ja 15 '15
Calculation of centrifugal stresses in turbine rotors; abstract. W: Kerr. Am Soc M E J 37:298-9 My '15
Chart of equivalent uniform loads for railway bridges. D. B. Steinman, Eng N 73:780-2 Ap 22 '15
Convex and concave drum beads. D. Telegraphics

Convex and concave drum heads, D. Hogan, Power 41:450 Mr 30 '15 Data on the strength and elastic properties of concrete-filled pipe columns, F. W. Swain and A. F. Holmes, Eng & Contr 44:184-5 S

8 '15 Design methods in concrete construction, J. Cochran. Concrete Cem 6:33-4, 83-5, 145-8, 190-2 Ja-Ap '15 Design of beams, girders and trusses. E. Mc-Cullough, diags Bidg Age 36:27-8 JI; 33-4 Ag; 29-30 S; 37-9 O; 37-9 N; 27-9 D '14; 37:39-41 Ja; 31-3 F; 27-8 Mr; 49-50 Ap; 49-50 My; 47-8 Je; 45-6 JI; 27-8 Ag; 29-30 S; 37-8 N; 51-2 D

Design of rectangular concrete beams. H. Harding. Am Soc M E J 37:529-31 S '15
Designing a steel dome for the horticultural palace at the Panama-Pacific international exposition. A. W. Earl and T: F. Chace. diags Eng N 74:208-12 JI 29 '15
Designing of reinforced concrete slabs subjected to bending and compression. A. Bull. Eng & Contr 43:454-6 My 19 '15
Determination of stresses in and design of cast iron lining for subaqueous tunnels. P. A. N. Seurot. diags Eng & Contr 43:90-2 F 3 '15
Determining the stresses in an offset beam. W: L. Cathcart. Mach 21:672 Ap '15
Diagram for net section of riveted tension members. T. A. Smith. Eng N 73:893 My 6 '15

Eccentric heel joint of roof truss; solution of problem. E: H. Rockwell. Eng N 74:796-8 Q 21 '15

Economic design of concrete slabs. J. N. Jensen. Eng Rec 71:170-1 F 6 '15

Sen. Eng Rec 71:10-1 F o 13

Effect of the end connections on the distribution of stress in certain tension members
C. Batho. il diags J Fr Inst 180:129-72 Ag '15
Abstract. Am Soc M E J 37:561-2 S '15; Abstract (Tests prove lug angles valueless for insuring uniform stress distribution). Eng Rec 72:512-14, 608 O 23, N 13 '15

Effects of quenching mediums. H. V. Wille il Iron Tr R 57:92-4 Jl 8 '15; Same cond. Iror Age 96:190-1 Jl 22 '15

Elastic curve applied to the design of the Sciotoville bridge. D. B. Steinman. Eng Ret 72:258-60 Ag 28 '15

Endurance of metals under repeated stresses; some new facts, and a new method of testing. diags Locomotive 30:130-42 Ja '15

Strains and stresses—Continued
Equivalent uniform loads for long-sp
bridges. D. B. Steinman. Eng N 73:370 F long-span

Experiments to determine stresses in parts of rope falls. C. S. Adams. Eng Rec 72:425-6 O 2 '15

Experiments to determine the forces imposed on a truck side frame and the stresses produced. L. E. Endsley. il diags Ry R 56:460-3, 494-7 Ap 3-10 '15; Same cond. Ry Age (Meched) 89:127-9 Mr '15
Failure of materials under repeated stress; abstract. F. H. Moore and F. B. Seeley. Iron Age 96:22-3 Jl '15
Failure of structural brasses. P. D. Merica and R. W. Woodward. Metal Ind n s 13:459-61 N '15 (to be cont)
Fixing the elastic limit standard. T. D. Lynch. il Iron Tr R 57:79-81+ Jl 8 '15
Full-load secondary stresses in elevated-railway bents. L. R. Manville. Eng N 74:949-51 N 11 '15 Experiments to determine the forces imposed

N 11 '15
Generalized form of Hooke's law. E. R. Hedrick. Eng N 74:542-3 S 16 '15
Graphical analysis of arches with fixed ends greatly simplified. C. S. Whitney. Eng Rec 72:324-6 S 11 '15
Is a part stronger than the whole? R. Fleming. diags Eng N 74:1026-7 N 25 '15
Lateral fixure of hollow pieces; abstract.
H: Lossier. diags Am Soc M E J 37:287-8
My '15
Lateral stresses on rails in curved tracks.

Lateral stresses on rails in curved tracks. G: L. Fowler. il Ry Age 59:319-22 Ag 20 '15 Magnetic studies of mechanical deformation in certain ferromagnetic metals and alloys.
H. Hanemann and P. D. Merica. il Am Inst.
Min E Bul 108:2371-85 D 15

Min F. Bul 108:2371-85 D: 15

Maximum stresses in tension reinforcement.
M. J. Lorente. Eng & Contr 42:366 O 14 '14

Mechanics of reinforced concrete under flexure in beam and slab types. C. A. P. Turner.

Boston Soc C E J 1:383-94 S '14; Discussion. 1:499-508; 2:23-47 N '14, Ja '15

Moments at eccentric heel-joint of roof truss.
E: Godfrey. Eng N 74:399 Ag 26 '15

Nomographic charts for simple beam design.
C: D. Conklin, jr. Eng Rec 71:309 Je 26 '15

Nomographic solutions for formulas of various types. R. C. Strachan. Eng Rec 71:807-9

Je 26 '15

Je 26 '15

Pressures on piles supporting masonry. R. P. V. Marquardsen. diags W Soc E J 20:541-7

Je '15; Same. Eng & Contr 44:392-3 N 17 '15

Ratio of circumferential to longitudinal stresses in boiler joints. J. K. Linderhurst. Power 41:611-12 My 4 '15

Reactions in a three-legged stiff frame with hinged column bases; with discussion. N. M. Stineman. W Soc E J 19:881-920 N '14

Rectangular pressure vessels. H. J. Vander Eb. Locomotive 30:164-9 Ap '15

Reinforced-concrete conduit analysis simplified by theory of displacements. C. S. Whitney. Eng Rec 72:486-8 O 16 '15

Results of some tests of I-beam connections. C. S. Whitney. diags Eng & Contr 44:35-7

Jl 14 '15

Secondary stresses and other problems in

J1 14 '15
Secondary stresses and other problems in rigid frames: a new method of solution. G: A. Maney. diags Minn U Bul 1:1-17 '15
Seventy-nine-ton derrick car lowers itself 50 feet in twenty-five minutes. A. S. Beale. il Eng Rec 72:78-9 J1 17 '15
Shear in beams. E. Jonson, Eng Rec 71:25
Jin 2 '15

Shrinkage and time effects in reinforced concrete. F. R. McMillan, il Minn U Bul 3:1-41 '15; Abstracts. Eng N 73:502-3 Mr 11 '15; Eng Rec 72:251-2 Ag 28 '15; Eng & Contr 44: 306-10 O 20 '15

Simple method of determining the stresses in concrete arches due to temperature and rib shortening. H. R. Thayer. Eng & Contr 44: shortening. I

173.4 S 1 '15
Special methods of reinforced concrete design;
with discussion. M. J. Lorente. diags Boston
Soc C E J 2:265-82 S '15

Steel headframe at no. 9 shaft, Republic mine, Vulcan, Mich. F. L. Burr, il diags Eng & Min J 100:430-5 S 11 '15

Stress analysis of the Chicago steel car. E. W. Rettger and S. G. George. Elec Ry J 45:291-2 F 6 '15

Stress distributions in engineering materials; report to the British association. Engineer 120:354-5 O 8 '15

Stresses in a rigid frame of two columns and a truss; with table, F. Freyhold, Eng N 73: 1031-3 My 27 '15

a truss; with table, F. Freyhold, Eng N '3: 1031-3 My 27 '15 Stresses in convex heads, F. F. Couch, diags Power 42:675-7 N 16 '15 Stresses in convex heads, F. G. Gasche, Power

41:59 Ja 12 '15

41:59 Ja 12 '15
Stresses in convex heads. H. J. Vander Eb. Power 40:817-18 D 8 '14
Stresses in steam pipes. S. U. Tuspin. Elec W 65:926-7 Ap 10 '15
Stresses in the mine roof. R. D. Hall. diags Am Inst Min E Bul 105:2013-21 S '15
Stresses in the Panama canal cranes. Eng N 74:86-8 Jl 8 '15
Struts and tie-rods in motion; abstract. H. Mawson. Am Soc M E J 37:659-60 N '15
Sudden cooling of boilers in cases of low water. R. N. Blackburn. Power 42:696-8 N 16 '15

Tie-rods for floor arches; a criticism of current practice. F. N. Kneas, diags Eng N 73: \_518-19 Mr 18 '15

518-19 Mr 18 '15.

Torsion strength of reinforced concrete beams.

Am Soc M E J 37:49-50 Ja '15

Torsional strengths of guy anchor rods. T.

Croft. diags Elec W 65:1607-9 Je 19 '15

Tower of jewels at exposition a 435-foot skyscraper on two-hinged arches. F. S. M. Harris. il diags Eng & Contr 43:47-54 Ja 20 '15;
Same cond. Eng Rec 71:112-16 Ja 23 '15;
Same cond. Eng N 73:866-72 My 6 '15

Wind stresses in skew bridges. J. P. J. Williams. Eng N 73:622-6 Ap 1 '15

See Alea Arches: Bridge design: Bridges:

liams, Eng N '13:022-6 Ap 1 10
See also Arches; Bridge design; Bridges;
Building; Columns; Earth pressure; Elasticity; Girders; Graphic statics; Rails—Stresses; Riveting; Roofs; Strength of materials;
Torque; Trusses; Wind pressure
Strassburg, Alsace
Dual ownership of public utilities in Alsace.
M. A. Jewett. Munic Eng 49:65-6 Ag '15

Stream flow

Long-term variations in stream flow, Croton, and Hudson rivers, E: H. Sargent, Eng N 72:1119 D 3 '14

See also Stream measurement; Water flow

Stream measurement
Collection and use of stream discharge data
in Pennsylvania. R. A. Boehringer, Eng Rec
71:109-10 Ja 23 '15
Diagram for estimating flow in channels and
conduits. G. D. Fish. Eng N 73:732-4 Ap 15

High coefficients of roughness for natural river channels. R. E. Horton. Eng N 73:827-8 Ap 29 '15
Relation of stream gaging to the science of hydraulics; abstract. C. H. Pierce and R. W. Davenport. Am Soc M E J 37:614 O '15
Small automobile opens up new opportunities in government stream gaging work. E. A. Porter. il Eng Rec 71:490-1 Ap 17 '15
Stream gaging by titration; comparative tests of new chemical and standard mechanical methods of gaging stream flow. L. W. Collet, R. Mellet and O. Lütschg. diag plans Eng & Contr 42:270-3 S 16 '14

Street accidents

Diminished illumination and accidents in the streets. Illum Engr 8:300-1 Jl '15; Same cond. Am Gas Light J 103:88 Ag 9 '15 London traffic dangers. Sci Am S 79:213 Ap 3

See also Automobile accidents; Street rail-roads—Safety devices and measures

Street car lighting. See Car lighting

Street cars

Albany service order. Elec Ry J 46:334-5 Ag 21 '15

All-service cars for East Liverpool, il plan Elec Ry J 45:765-6 Ap 17 '15 All-steel one-man car. il Elec Ry J 46:72-3 Jl

Balanced door-operating mechanism, J: Sutherland, il Elec Ry J 45:1038-9 My 29 '15 Bay State combination car. il diag Elec Ry J 46:854-7, 1068-73 O 23, N 27 '15

Bolts and screws. Elec Ry J 46:449-50 S 11 '15

Street cars -Continued

Car-door operation with sprocket chain and worm shait J. N. Lloyd, if Elec Ry J 45: 590-1 Mr 20 '15

590-1 Mr 20 '15
Car maintenance records at Los Angeles. Elec
Ry J 45:1214-15 Je 26 '15
Center-entrance cars for Wilkes-Barre, Pa. il
Elec Ry J 45:518 Mr 13 '15
Convertible car for general service. il Elec Ry
J 46:71 Jl 10 '15

Converting open cars into the end-entrance type. A. C. Colby. il plan Elec Ry J 46:451-2 S 11 '15

Correct-posture seats, il diags Eng M 49:588

Development of a light, low-floor car for San Francisco. J. M. Yount. il Elec Ry J 46:515 S 18 '15

S 18 '15 Dubuque remodels cars for one-man operation. il plan Elec Ry J 46:1090 N 27 '15 Economies in operating small cars. J. F. Layng. Elec Ry J 45:979-80 My 22 '15 Economies of the light car and of ball bear-ings. A. V. Farr. Elec Ry J 46:239-40 Ag 7

Experience with the one-man electric car in a small city. R. M. Howard, il Elec Ry J 45:233-4 Ja 30 '15

Experimental open-car reconstruction in Atlan-

tic City. G: F. Faber. il diags Elec Ry J 46: 110-11 Jl 17 '15

Front entrance, center-exit car for Cleveland.
il plan Elec Ry J 45:364-6 F 20 '15
Front exit Glasgow double-deck car with
folding step, il plan Elec Ry J 45:297-8 F 6

folding step. ii plan Elec Ry J 46:297-8 F 6 '15
Helical springs. Elec Ry J 46:409-10 S 4 '15
Improvements in the low-floor car. il diags
Elec Ry J 46:4-7 Jl 3 '15
Inclosed prepayment cars for Baltimore. il diags Elec Ry J 45:86-9 Ja 9 '15
Kansas City's new cars. R. L. Weber. il Elec Ry J 46:771-2 O 9 '15
Los Angeles illuminated end destination sign with car and run numbers. E. L. Stephens. il Elec Ry J 45:1105 Je 19 '15
Low-floor California-type car. W. B. Farlow. il Elec Ry J 45:11016-18 My 29 '15
Making the standee comfortable. diags Elec Ry J 46:26 Jl 3 '15
Manual and pneumatic door and step control. il Elec Ry J 46:958-60 N 6 '15
New cars for Kansasa City. plans Elec Ry J 45:870-4 F o '15
New cars of Seattle municipal railway. H. J.

New cars of Seattle municipal railway. H. J. Kennedy, il diag Elec Ry J 44:1284-6 D 12 '14 New York municipal car—brakes and auxili-aries. il diags Elec Ry J 45:872-80 My 8 '18

New York municipal car—motors, control, conduit and collectors, il diags Elec Ry J 45: 496-503 Mr 13 '15

New York municipal car—the lighting. W. G. Gove. il Elec Ry J 45:614-18 Mr 27 '15

New York municipal car—trucks, brake rig ging and draft gear. il diags plan Elec Ry 44:1376-81 D 26 '14

One-man car as an effective means of reducing headway. G. A. Richardson, Elec Ry J 46:572 S 18 '15

One-man cars in Anniston, Ala. A. L. Ken-yon. Elec Ry J 46:1035 N 20'15

Quick-acting adjustable seat for motormen, il Elec Ry J 46:114 Jl 17 '15

Route signs for surface cars, il Elec Ry J 46: 260-2 Ag 14 '15

Scientifically designed car seats, il diag Eng N 73:24 Ja 7 '15

Small car versus the large car. D. C. Hershberger. Elec Ry J 46:394-5 S 4 '15
Standardization of twelve car types into two at Los Angeles. E. L. Stephens. il Elec Ry J 46:493-5 S 18 '15

Steel cars in city service. il Elec Ry J 46:405-6

Steel underframe, open-bench car. il diags Elec Ry J 45:1171-2 Je 19 '15

See also Car houses; Car trucks; Car wheels; Cars; Electric railroads—Rolling stock; Street railroads

Cleaning

See Car cleaning

Heating

See Car heating

Lighting

See Car lighting

Trailers

Boston center-entrance trailer, il Elec Ry J 45:1154-5 Je 19 '15 Boston elevated center-entrance trailer, diag plan Elec Ry J 45:99 Ja 9 '15 Two-car trains on 25 per cent grade, diags Elec Ry J 45:977-8 My 22 '15

Street cleaning

treet cleaning Clean-up week in the city of New York, il Good Roads n s 9:232-3 Je 5 '15 Dust prevention and street cleaning. W: H. Connell. Good Roads n s 9:103-6 Mr 6 '15 Dust suppression and street cleaning practice in Philadelphia. W: H. Connell. Good Roads n s 10:249-52 N 6 '15; Same abr. Eng & Contr 44:238-42 S 29 '15 Manchester street cleaner. il Munic J 39:375-6

S 2 '15
Methods of street cleaning. E: D. Very. Good Roads n s 9:221-2 Je 5 '15
Milwaukee bureau of street sanitation. Munic J 37:888-90 D 17 '14
Notes on the development of street cleaning methods. E: D. Very. Eng & Contr 42:394-6 O 21 '14; Abstract. Eng N 72:831 O 22 '14
Philadelphia street cleaning by contract. Eng N 74:6-7 Jl 1 '15
Street cleaning data from thirty-one cities. Munic J 38:37-8 Ja 14 '15
Street cleaning in Calgary. il Munic Eng 49: 72-3 Ag '15

12-5 Ag 15 Street cleaning in Calgary, W. E. Hardenburg, il Munic J 38:651-2 My 13 '15 Street cleaning in Chicago, Munic J 38:35 Ja 14 '15

Street cleaning in Grand Rapids, Mich. il Munic J 39:218 Ag 12 '15
Street cleaning in New York. il Munic Eng 48: 46-8 Ja '15
Street cleaning notes. Munic J 37:851 D 10 '14
Tables of street cleaning statistics furnished by officials of 150 cities. Munic J 37:833-45 D 10 '14

See also Cleaning of sittle

See also Cleaning of cities; Refuse and refuse disposal; Refuse collection; Snow removal; Street sprinkling

# Cost

Cincinnati street cleaning. Munic J 38:38-9 Ja

14 '15
Comparative cost of street sweeping and sprinkling with mules and with motors. Munic Eng 48:305 My '15
Cost of cleaning various kinds of city pavements. Eng N 73:889 My 6 '15
Machine vs. hand sweeping. il Munic Eng 48: 317-18 My '15
New York street cleaning. il Munic J 39:842-4
D 2 '15
Paggodis of Washington's street cleaning.

Records of Washington's street cleaning. Munic J 38:654-5 My 13 '15

Street cleaning by motors in Houston. Munic J 38:468-9 Ap 8 '15

Street cleaning in Des Moines. Munic J 38:313 Mr 11 '15

Street cleaning in New Rochelle, N. Y. Munic J 38:468 Ap 8 '15

Street cleaning in Norristown, Pa. S. C. Corson. Munic J 38:189 F 11 '15

Street sweeping in Boise, J. M. Sharp, Munic J 39:394-5 S 9 '15

Total annual cost of street cleaning. Munic J 37:885-6 D 17 '14

Street cleaning apparatus

Exhibit of modern street-cleaning apparatus. il Eng N 72:1139-42 D 3 '14

Exhibit of modern street-cleaning apparatus: refuse collection, il Eng N 72:1304-5 D 31 '14 Merritt pick-up street sweeper. il Eng N 74: 207 Jl 29 '15

Motor-driven squeegee used for first time on streets of Milwaukee, Wis. il Munic Eng 49: 123 S '15

Street cleaning apparatus Continued
2d annual exhibition of street cleaning machinery and appliances in New York city, il
Good Roads ns 10:228-9 O 16 '15
Sprinkler-sweeper, il Munic J 39:269 Ag 19 '15
Street cleaning appliances: exhibits at the New
York street cleaning department exhibition,
il Munic J 37:858-66 D 10 '14

Street cleaning apparatus, Electric

Electrically driven street sweeper. il Elec R & W Elec'n 66:495 Mr 13 '15

Street cleaning apparatus, Motor

Street cleaning apparatus, Motor Street cleaning at Springfield, Ohio, with motor driven apparatus, G: L. Rinkliff. Eng & Contr 43:324-5 Ap 7 '15

Street cleaning by motor apparatus. G: L. Rinkliff. il Munic J 38:33-4 Ja 14 '15

Street cleaning by motors in Houston. Munic J 38:468-9 Ap 8 '15

Street excavations. See Street openings

Street excavations. See Street openings

Street lighting

Diminished illumination and accidents in the streets. Illum Engr 8:300-1 Jl '15; Same cond. Am Gas Light J 103:88 Ag 9 '15

Effective illumination of streets. P. S. Millar. diags 11 pls Am Inst E E Pro 34:1379-98 Jl '15; Abstract. Elec W 66:62-4 Jl 10 '15; Discussion. Am Inst E E Pro 34:3053-62 D '15

Electric lighting data: station equipment—amount of current used for street lighting and other purposes—fuel statistics—number and kind of lamps used for street lighting—ornamental lighting—rates. Munic J 38:884-94

Je 24 '15

Engineers' report on Milwaukee street lighting.
Elec R & W Elec'n 66:1208 Je 26 '15
Experience with mazda gas-filled street lamps.
C. H. Shaw. Elec R & W Elec'n 66:416 Mr
6 '15

6 '15 Flame-arc lighting of Indianapolis' streets. il Elec W 66:452-3 Ag 28 '15 Gas-filled units for New York street lighting. il Elec W 65:1639 Je 19 '15 Glare as a factor in street lighting. A. J. Sweet, Elec R & W Elec'n 66:439-43 Mr 6

'15
High intensity street lighting of European cities compared with New York. C. F. Lacombe. il Illum Eng Soc 9:614-32 no 7 '14
Improved street lighting at Hot Springs, Ark. il diag Elec W 65:1069-70 An 24 '15
Installation of luminous arc lamps in Worcester. il Elec R & W Elec'n 66:25-8 Ja 2 '15
Lighting city streets. charts Munic J 39:467-9 S 23 '15

Lighting city streets. charts Munic J 39:467-9 S 23 '15
Lighting residence streets in Helena. C: W. Helmick. il Munic J 37:917-18 D 24 '14
Modern street illumination. W. Harrison. il Munic J 38:877-80 Je 24 '15
Modern street lighting units. L: Bell. Elec R & W Elec'n 66:1038-9 Je 5 '15
Modern street lighting with mazda lamps. H. A. Tinson. il Gen Elec R 18:659-65 Jl '15
Modern street lighting with mazda lamps. H. A. Tinson. il Gen Elec R 18:659-65 Jl '15
New step in street illumination. I. Ladoff. plan Elec R & W Elec'n 66:691-5 Ap 10 '15
Nitrogen-filled lamps in Chicago. il Elec W 65:1173-4 My 8 '15
Operation of mazda C street lamps. C. H. Shaw. Elec R & W Elec'n 67:297 Ag 14 '15
Parallel vs. staggered arrangement of lamps. H. E. Butler. il Elec W 66:1027-8 N 6 '15
Payment for special street lighting. Elec R & W Elec'n 65:1129-30 D 12 '14
Principles of scientific street lighting; abstracts. A. J. Sweet. Elec R & W Elec'n 66: 999-1000 My 29 '15: Elec W 65:1485 Je 5 '15
Progress in street lighting; committee report. Illum Eng Soc 10:537-43 no 7 '15; Excerpt. Am Gas Light J 103:276 N 1 '15
Safety precautions in view of the diminished public lighting. Illum Engr 8:301-2 Jl '15
Street illuminating arches, Portland, Ore. L. R. W. Allison. il Eng N 73:638 Ap 1 '15
Street illumination tests; committee report. Elec W 65:1521-2 Je 12 '15
Street lamp inspection and maintenance in Sheboygan. C. II. Shaw. il Elec R & W

Street lamp inspection and maintenance in Sheboygan, C. H. Shaw, il Elec R & W Elec'n 66:621-2 Ap 3 '15 Street lighting in Chicago. P. E. Haynes, il Illum Eng Soc 10:281-8 no 3 '15; Same cond. Am Gas Light J 102:316-17 My 17 '15

Street lighting in Seneca Falls, N. Y. il Munic J 39:436 S 16 '15

Street lighting of London, W. B. Conant. il Munic Eng 48:333-6 Je '15 Street lighting practice with incandescent lamps. G. H. Stickney. il Munic Eng 48:80-8

Street-lighting requirements. W: E. Wickenden. Elec R & W Elec'n 65:1146 D 12 '14 Street-lighting tables for 1915, Elec W 64:1135 D 12 '14

Street-lighting tables for 1915. Elec w 04:1150 D 12 '14
Street lighting with half-watt lamps; abstract. L. Bloch. Elec W 64:1259 D 26 '14
Street lighting with modern arc lamps. W. P. Hurley. Illum Eng Soc 10:405-6 no 5 '15
Three white-way installations in Ohio. il Elec W 65:1709 Je 26 '15
Time switch for series-tungsten street-light-

Time switch for series-tungsten street-lighting system. J. P. Byron, diags Elec W 65: 223 Ja 23 '15

See also Electric lamps, Tungsten; Light-

### Contracts

Boston street-lighting contract signed. Elec W 64:1185 D 19 '14 Contracts for street lighting. Elec W 64:1089-90 D 5 '14

90 D 5 '14
Proposed street lighting contract. C: A. Tripp.
Munic Eng 48:168-9 Mr '15
Street lighting in Rochester; terms of contract and specifications. Munic J 38:392-3
Mr 25 '15
Street lighting in Youngstown. W: A. Mason.
Munic J 38:593-4 Ap 29 '15

Cost

Comparative cost of flame-arc and nitrogenfilled incandescent lighting for streets. Elec
W 65:682 Mr 13 '15

Comparative cost of magnetite-arc and nitrogen-filled tungsten street-lighting units. J. H.
Loban. Elec W 66:109 JI 10 '15

Cost of boulevard lighting and street sprinkling and flushing in Grand Rapids, Michigan.
Eng & Contr 42:485-6 N 18 '14

Gas and electric street lights; comparison of
cost and efficiency. il Munic Eng 49:96-8 S
'15

'15
Saving of \$400,000 effected in New York city by substituting incandescent lamps for arc lamps. it Elec W 66:512-13 S 4 '15
Street lighting in Chicago: report. Elec R & W Elec'n 67:481 S 11 '15; Excerpt. Elec W 66:315 Ag 7 '15
Street lighting in Youngstown. W: A. Mason. Munic J 38:593-4 Ap 29 '15
Street lighting; tabulation. Munic J 38:890-2, 894 Je 24 '15
Tucson's ornamental lighting. it Elec W 66:761 O 2 '15

Municipal powers re. lighting plants. J. Simpson. Munic J 38:880-3 Je 24 '15

## Rates

Factors in rate-making. A. S. Ives. Elec W 65:988-9 Ap 17 '15

65:988-9 Ap 17 '15

Street lighting fixtures
Cleveland lantern for ornamental lighting. W.
Harrison. il Elec W 66:521-4 S 4 '15

Concrete lighting standards for bridges at
Houston, Texas. W. W. Washburn. il diags
Concrete Cem 6:123-4 Mr '15
Gas-filled ornamental lighting at Rockville
Center, N. Y. A. L. Powell. il Elec W 66:
483 Ag 28 '15
Gas street lighting development. F. R. Hutchinson. il Am Gas Light J 102:356-8 Je 7 '15
Lighting city streets. charts Munic J 39:467-9
S 23 '15

S 23 '15
Mazda-lamp fixtures for street-lighting service, il Elec R & W Elec'n 65:1191-2 D 19 '14
New Cutter street-lighting fixtures, il Elec
R & W Elec'n 66:359-60 F 20 '15
Novalux units for mazda series street lighting, il Elec R & W Elec'n 67:910-11 N 13

Ornamental lighting posts that show the house numbers. A. Marple, il Elec W 66:705 S 25 '15

Ornamental street-lighting systems compared, H. E. Mahan and H. E. Butler, il diags Elec W 66:180-2 Jl 24 '15 Salt Lake City's new arc-lighting system, il Elec W 66:1070 N 13 '15

Street lighting fixtures—Continued Series street-lighting fixtures i ciency tungsten lamps. il Elec W 66:1161-2 N 20 '15

Street lighting fixtures, il Munic Eng 48:8-9 Ja '15

Street-lighting fixtures for type C mazda lamps, il Elec R & W Elec'n 67:299-300 Ag

Temporary isle-of-safety lamps for Chicago boulevards, diag Elec W 65:351-2 F 6 '15 Tucson's ornamental street-lighting system, il Elec R & W Elec'n 66:962-3 My 22 '15

# Street mapping. See City planning

Street oiling

Method and cost of street oiling in Carlisle, Pennsylvania. J: C. Hiteshew. Eng & Contr 43:513 Je 9 '15 Surface oiling of city streets. T. R. Agg. Munic J 38:653-4 My 13 '15

Street openings

treet openings

Appellate court of the state of New York and the question of allowances for paving over mains in valuation work. J: W. Alvord. Am Water Works Assn J 2:465-81 S '15; Same cond. Eng & Contr 43:532-5 Je 16 '15; Discussion. Am Water Works Assn J 2:482-92 S

'15
Argument for the ownership of water services by the utility. M. L. Cooke. Eng & Contr 44:386-7 N 17 '15
Control of openings in street pavements and the cost of restoration in Cincinnati. Eng & Contr 42:347 O 7 '14
Ordinances regulating street excavating—replacement by city. Munic Eng 48:116-18 F '15

Regulating street excavations; digest of ordinances of eight cities. A. L. Bostwick. Munic J 38:281-2 Mr 4 '15 Repairing brick pavements after street excavations. P. J. Masterson. Eng N 73:997 My 20 '15; Same. Good Roads ns 9:150 My 1 '15; Munic Eng 48:308-9 My '15; Munic J 38: 628-9 My 6 '15 Street openings in Cleveland. Munic J 38:282-3 Mr 4 '15

Street railroad law

Illinois commission prescribes minimum clear-ances. Ry R 56:633-6 My 8 '15

Street railroads—Franchises; Street railroads-Regulation

Street railroads

treet railroads
Autos and the electric car. J: A. Beeler. Elec
Ry J 46:590-2 S 18 '15
British India. il U S Sp Cons Rep 72:81-4 '15
British India. il U S Sp Cons Rep 72:81-4 '15
Buffalo's railway facilities; sketch of past
and present conditions. E. J. Dickson. Elec
Ry J 45:135-6 Ju 16 '15
Convention of Pennsylvania association. Elec
Ry J 44:1293-9 D 12 '14
Iowa street & interurban railway association
12th annual convention. Elec Ry J 45:839-41
Mv 1 '15

My 1 '15 Pennsylvania street railway association spring meeting; workmen's compensation, organ-ized safety, small car operation and other topics discussed. Elec Ry J 45:935-6, 979-82 My 15-22 '15

See also Cable railroads; Car houses; Electric railroads; Elevated railroads; Motor cars (street railroad); Rapid transit; Snow removal; Street cars; Subways; also names of cities, subhead Rapid transit

## Accidents

Argument on authority of Interstate commerce commission to require reports of accidents and other statistics from urban railways. J. T. Beasley. Elec Ry J 44:1389-90 D 26 '14

Investigation and handling automobile accidents. J. S. Mills. Elec Ry J 45:1203-4 Je 26

Legal aspects of accidents. G: P. Hoover. Elec

Ry J 45:461 Mr 6 '15 Ruling on accident reports. Elec Ry J 45:883-4 My 8 '15

See also Subways-Accidents

## Advertising

Chicago surface lines advertise. Elec Ry J 46: 823-5 O 16'15

### Care

See Street cars

### Claims

Medical and claim departments, J. H. Handlon, Elec Ry J 46:63 Jl 10 '15 Pacific coast claim agents' 7th annual con-vention; abstracts of papers. Elec Ry J 46:8-12 Jl 3 '15

Papers before the Claims association. W: Tichenor. Elec Ry J 46:811-21 O 16 '15
Pittsburgh railways claim department. Elec Ry J 46:139-45, 436-41 Jl 24, S 11 '15

See also Railroads-Claims

## Complaint bureaus

Complaint bureaus. Elec Ry J 45:23-7 Ja 2 '15 Ironing out the wrinkles, A. W. Warnock. Elec Ry J 46:264-7 Ag 14 '15

### Construction

Municipal street railways. A. J. Cleary. il maps Eng N 73:320-2 F 18 '15

See also Electric railroads-Construction: Street railroads—Crossings; Street railroads—Track

## Cost of operation

Operating cost and shifts in service. F. W. Doolittle. Elec Ry J 46:306-8 Ag 21 '15

## Crossings

Practical views of special work—the crossing, R. P. Williams, diags Elec Ry J 46:678-80

Recent manganese steel crossings, C. L. Haw-kins; E. P. Roundey. Elec Ry J 45:892 My

Solid manganese steel crossings in Chicago. il diags Elec Ry J 45:711-12 Ap 10 '15

## Employees

Baltimore's pension system. Elec Ry J 45: 172-3 Ja 23 '15
Bay State street railway arbitration. Elec Ry J 45:708-10, 854, 1019-21, 1205-6 Ap 10, My 1, 29, Je 26 '15

29, Je 20 15 Chicago arbitration. Elec Ry J 45:1128; 46:34, 75-6 Je 12, Jl 3-10 '15 75-6 Je 12, Jl 3-10 '15 Chicago arbitration award. Elec Ry J 46:118 Jl 17 '15

Chicago's two-day strike, Elec Ry J 45:1165-8 Je 19 '15

Courtesy of platform men. Elec Ry J 45:20-3 Ja 2 '15

Detroit strike. Elec Ry J 45:998 My 22 '15

Detroit strike. Elec Ry J 45:998 My 22 '15 Employees receive increase in Chicago. Elec Ry J 46:146-9 Jl 24 '15 Employment on city lines, H. A. Bullock. Elec Ry J 45:454 Mr 6 '15 Following up platform recruits at Syracuse, Elec Ry J 45:704 Ap 10 '15 Fort Wayne strike. Elec Ry J 46:684, 1004 O 2, N 13 '15

Holyoke arbitration. Elec Ry J 46:883 O 23 '15 Modern railway school, il plans Elec Ry J 46: 344-53 Ag 28 '15

344-53 Ag 28 15 Recreation and welfare work for Los Angeles railway employees. L. O. Lieber, il Elec Ry J 46:506-7 S 18 '15 Report of the Transportation and traffic asso-

ciation committee on training transportation employees. Elec Ry J 46:766 O 9 '15 Rhode Island wage arbitration. Elec Ry J 46:903-5 () 30 '15

Seven per cent wage reduction granted; British Columbia electric railway, ltd. Elec Ry J 46:392-4 8 4 '15 Strike at Wilkes-Barre again. Elec Ry J 46: 882 O 23 '15

Syracuse arbitration. Elec Ry J 45:999 My 22

Welfare and educational work among employ-ees. R: Meriwether. Elec Ry J 45:1029 My 29

Welfare work, J. W. Lilienthal. Gen Elec R 18:1092-7 D '15; Same cond. Elec Ry J 46: 710-12 O 9 '15 Women fast taking the places in tramway service of men needed at the front. Elec Ry J 46:33 Jl 3 '15

### Equipment and supplies

Electric garment dryer conserves health and schedules. il Elec Ry J 45:300 F 6 '15

Street railroads—Equipment —Continucd Track tools—supplies and appliances. Cram. Elec Ry J 45:1169-70 Je 19 '15 R. C.

Fare collecting

Collection and registration of city and interurban fares, J. E. Hewes, Elec Ry J 45: 466-7 Mr 6 '15
Front-end fare collection improves service at San Francisco, H: T. Jones, il Elec Ry J 46:512-14 S 18 '15

### Fare registers

Automatic fare collector and change-making machine. il Elec Ry J 46:1047-8 N 20 '15 Automatic registration of fares. G: F. Rooke. Elec Ry J 45:844 My 1 '15 Combination fare box and recorder. il Elec Ry J 44:1261 D 5 '11 Combination fare registers for coins, metal tickets and transfers. il Elec Ry J 44:1262

Metal ticket and fare box effect saving. Elec Ry J 46:1047 N 20 '15 New computing fare recorder. il Elec Ry J 45:145 Ja 16 '15

New computing fare recorder. If Elec Ry J 45:145 Ja 16 '15

New form of cash and ticket fare box. il Elec Ry J 45:1081-2 Je 5 '15

New forms of fare indicators and recorders. il Elec Ry J 45:1173-4 Je 19 '15

Prepayment cars and the accountant. R. J. Clark. Elec Ry J 46:721-2 O 9 '15

Universal register for electric railway service. il Elec Ry J 46:113-14 Jl 17 '15

Another Massachusetts fare increase; the Blue Hill street railway, map Elec Ry J 46:226-8 Ag 7 '15

Decision in Rochester fare case. Elec Ry J 45:439-40 F 27 '15 Fare increase asked in Milwaukee. Elec Ry J 46:889, 1099 O 23, N 27 '15 Hearing on fare increase. Elec Ry J 45:863 My 1 '15

Milwaukee fare case decided. Elec Ry J 46: 52-3 Jl 10 '15

52-3 Jl 10 '15 Reduction in city fare by the British Columbia electric railway, Vancouver, B. C. Elec Ry J 45:959-60 My 15 '15 Report of the A. E. R. A. committee on fares and transfers. Elec Ry J 46:764-5 O 9 '15 Trenton, N. J., fare hearing. Elec Ry J 46: 931 O 30 '15

Zone system of fares. Elec Ry J 45:826 My 1

Zone system of fares in practice; with discussion. R. B. Stearns. Elec Ry J 45:836-8 My 1 '15

See also Electric railroads—Fares; Street railroads—Fare collecting; Street railroads— Transfers

## Finance

Another Massachusetts fare increase; the Blue Hill street railway, map Elec Ry J 46: 226-8 Ag 7 '15
Apportionment of cost of highway bridges between street railways and cities; with discussion. C: M. Spofford, il diags W Soc E J 20:405-43 My '15
Brooklyn rapid transit. Ry Age 59:223-4 Ag 6

'15
Interborough rapid transit company, New York; comparative statement of income, profit and loss for the years ended June 30, 1914 and 1915. Elec Ry J 46:606-7 S 18 '15
Investment required per passenger. D. J. M'Grath. Elec Ry J 45:881-3 My 8 '15
Kansas City supplemental plan. Elec Ry J 46: 1054-5 N 20 '15

Washington railway & electric company's profit-sharing checks. C. P. King. Elec Ry J 45:157-8 Ja 16 '15

See also Street railroads—Taxation; Street railroads—Valuation

### Franchises

Des Moines ordinance. Elec Ry J 46:461 S 11

Furthering the progress of the Toledo fran-chise. Elec Ry J 46:684-5 O 2 '15

Toledo tentative draft completed. Elec Ry J 46:245-6 Ag 7 '15

## Inspection

Car service inspection in Seattle, J. W. Mc-Cloy. Elec Ry J 46:272-3 Ag 14'15 Inspecting equipment in Greater New York, W: C. Whiston, Elec Ry J 45:133 Ja 16'15

## Inspection of watches

See Street railroads-Management

### Law

See Street railroad law

## Lost articles

Handling lost articles. Elec Ry J 45:28 Ja 2 '15

### Management

Departmental work planning system at Portland, Ore. F. P. Maize. il Elec Ry J 46:565-7 S 18 '15

d future—set forth. Eng Rec 71:427-8 Ap urban transportation needs-present

3 '15 Distatching city cars. E: Dana. il Elec Ry J 45:802-3 Ap 24 '15 Experience with the one-man electric car in a small city. R. M. Howard. il Elec Ry J 45: 233-4 Ja 30 '15 Lancaster's experience with time-inspection system, R. B. Hull, Elec Ry J 46:1034-5 N 20

Pittsburgh railways claim department. Elec Ry J 46:139-45, 436-41 Jl 24, S 11 '15 Public-be-pleased policy in practice. Elec Ry J 45:20-33 Ja 2 '15 Report on Detroit traffic. Elec Ry J 45:664-5 Ap 3 '15

AP 3 '15
Telephone dispatching at San Antonio. il Elec
Ry J 46:92-3 Jl 17 '15
Telephone dispatching in city service. E. E.
Strong. il Elec Ry J 45:885-7 My 8 '15
Telephone dispatching on street-railway lines.
il Elec R & W Elec'n 65:1150-1 D 12 '14

See also Street railroads—Complaint bu-reaus; Street railroads—Employees; Street railroads—Public relations; Street railroads— Records; Street railroads—Routes; Street railroads—Schedules; Street railroads—Stops

## Municipal ownership

See Street railroads, Municipal

## Near-side stop

See Street railroads-Stops

## Public relations

Public relations

Code of principles. T. S. Williams. Elec Ry J
45:220-2; Discussion. G. E. Tripp; M. C.
Brush. 45:214-16 Ja 30 '15

Public-be-pleased policy in practice. Elec Ry J
45:20-33 Ja 2 '15

Publicity in Atlanta. Elec Ry J 45:111 Ja 9 '15

Welfare work. J. W. Lilienthal. Gen Elec R
18:1092-7 D '15; Same cond. Elec Ry J 46:
710-12 O 9 '15

See also Street railroads—Franchises; Street railroads—Regulation; Street rail-roads—Service; Street railroads, Municipal

### Records

Car service inspection in Seattle. J. W. Mc-Cloy. Elec Ry J 46:272-3 Ag 14 '15 Card index and what it means. J. J. Reynolds. Elec Ry J 46:815-18 O 16 '15 Collection of traffic data. F. W. Doolittle. Elec Ry J 46:94-101 J1 17 '15

Departmental work planning system at Port-land, Ore. F. P. Maize, il Elec Ry J 46:565-7 S 18 '15

Novel service record chart, Elec Ry J 45:366 F 20 '15

Standardization of claims statistics. E. E. Slick. Elec Ry J 46:813-15 O 16'15

## Referendums

Public referendums. Elec Ry J 45:27-8 Ja 2 '15

### Regulation

Argument on authority of Interstate commerce commission to require reports of accidents and other statistics from urban railways. J: T. Beasley. Elec Ry J 44:1389-90 D 26 '14

Regulation of public utilities. L. A. Busby. Elec Ry J 46:1081-4 N 27 '15

Street railroads—Regulation Continued
St. Louis service order; Missouri commission
fixes service standards, defining rush-hour
periods, transition periods and non-rushhour periods. Elec Ry J 45:961 My 15 '15

See also Street railroad law; Street railroads—Franchises; Street railroads—Public relations; Street railroads, Municipal

### Routes

Traffic congestion problem in Brooklyn, N. Y. W. H. Messenger, il Munic Eng 48:19-25 Ja

# Safety devices and measures

Brooklyn rapid transit safety work for employees. Elec Ry J 44:1291-2 D 12 '14
Brooklyn safety reports for employees. Elec Ry J 45:1196-7 Je 26 '15
Moving picture exchange for A. E. R. A.?
F. J. Warnock, Elec Ry J 46:820-1 O 16 '15
Organized safety, L. R. Palmer, Elec Ry J

Organized safety, L. R. Palmer, Elec Ry J 45:936 My 15 '15 Public school safety work in Brooklyn. Elec Ry J 46:691 0 2 '15 Relation of safety to conservation. B. F. Boyn-ton. Elec Ry J 46:819-20 0 16 '15 Safety-first committee meets. Elec Ry J 46: 103-5 Jl 17 '15 Safety first movement, il Elec Ry J 45:34-46 Ja 2 '15

### Schedules

Express cars in city service. Elec Ry J 44: 1342 D 19 '14
From traffic study to time-table, F. W. Doo-little, Elec Ry J 46:587-9 S 18 '15
Operating cost and shifts in service, F. W. Doolittle, Elec Ry J 46:306-8 Ag 21 '15
Report of committee of A. E. R. A. on schedules and time-tables. Elec Ry J 46:757-9 O 9 '15

9 '15 Schedule speed—a neglected factor. Elec Ry J 45:742-3 Ap 17 '15 Schedule speed in city service. Elec Ry J 45: 29-30 Ja 2 '15 Time-table practice of the San Francisco-Oak-land terminal railways. U. S. Sliter. Elec Ry J 46:521-2 S 18 '15 Traffic analysis and schedule planning at Port-land, Ore, F. Cooper, Elec Ry J 46:562-4 S 18 '15

See also Street railroads—Service; Street railroads—Stops

## Service

Commission fixes service standards in Chicago. Elec Ry J 46:775 O 9 '15 Manila company submits service brief. Elec Ry J 46:672-3 O 2 '15

## Shelter stations

Shelter-station for car passengers. K. C. Cardwell. il Munic J 39:474 S 23 '15 Waiting stations and shelters. Elec Ry J 45:33 Ja 2 '15

### Shops

See Electric railroads-Shops

## Stations

Sec Street railroads—Shelter stations; Street railroads—Terminals

## Statistics

Bay State street railway arbitration. Elec Ry J 45:708-10 Ap 10 '15 Census report on electric railways. Elec Ry J 45:130-2 Ja 16 '15 Charts exhibited in Rhode Island company wage arbitration hearings. Elec Ry J 46:664 O 2 '15

### Stops

Express and skip-stop service in Denver, C. B. Wells. Elec Ry J 46:448 S 11 '15 Near-side stop. Elec Ry J 45:31-2 Ja 2 '15 Skip-stops in St. Louis. Elec Ry J 46:185-6 J1

Skip stops saves time. Elec Ry J 46:651 S 25

## Taxation

St. Louis mill tax decision: upholds the right to tax fares of the United railroads. Elec Ry J 45:70 Ja 2 '15

### Terminals

Newark railway terminal and utilities build-ing, il plans Eng N 74:836-40 O 28 '15 Newark terminal to relieve traffic congestion, diag maps Eng N 74:680-2 O 7 '15

rrack
All-babbitted center. R. P. Williams. diags
Elec Ry J 44:1352-3 D 19 '14
Baltimore experience in paving street-railway
tracks. H. D. Williar, jr. il diags Eng N 73:
\$84-5 My 6 '15
Card records of Los Angeles track work. G. E.
Campbell. Elec Ry J 46:407-8 S 4 '15
Columbus uses new joint and track foundation.
E. O. Ackerman. il diags Elec Ry J 46:956-7
N 6 '15
Concrete pavement in the track allowance.

Concrete pavement in the track allowance. H. C. Campbell. il Elec Ry J 46:998-1000 N 13

Cost of concrete header along rails. H. R. Ferris. Eng & Contr 43:545 Je 16 '15
Deferred maintenance. C. H. Fuller. Elec Ry J 45:791-3 Ap 24 '15
Detail cost of frack work with steel twin ties.
A. J. Wolfe. diags Elec Ry J 46:916-17 O 30 '15

Discussion of depreciation, P. J. Kealy. Eng & Contr 4:118-23 Ag 18 '15
Flange-bearing special work. A. E. Harvey. Elec Ry J 46:64 Jl 10 '15
Flange-bearing track intersections for street railways. dlags Eng N 73:158-9 Ja 28 '15
Girder and high T-rail renewals. A. Swartz; C. L. Hawkins. Elec Ry J 46:400-1 S 4 '15
Girder and high T-rail renewals. B. P. Legare. Elec Ry J 46:320 Ag 21 '15
Girder and high T-rail renewals, D. P. Falconer. Elec Ry J 46:829-31 O 16 '15
Girder and high T-rail renewals. E. M. Haas. diags Elec Ry J 46:179-84 Jl 31 '15
Girder and high T-rail renewals. G: L. Wilson; E. P. Roundey. Elec Ry J 46:592-3 S 18 '15

Girder and high T-rail renewals. W. F. Graves; R. C. Cram. Elec Ry J 46:872-3 O 23 '15 Grinding rail with carborundum track brake shoes. il Elec Ry J 46:241 Ag 7 '15 Joint repairs on American city railways. S. Gausmann. Elec Ry J 45:803-4 Ap 24 '15 Laying new rails on old ties embedded in concrete, St. Louis, Mo. il Eng N 74:840-1 O 28 '15

crete, St. Louis, Mo. II Eng N 74:540-1 O 28 '15
Laying street-railway track without ties. E. R. Horton, jr. diags Eng N 74:594-9 S 23 '15
Life of way structure as affected by engineering and municipal conditions. P. N. Wilson. diags Elec Ry J 45:122-13 Je 26 '15
Manganese steel special work. Elec Ry J 45: 576-8 Mr 20 '15
Methods and costs of concreting for modern pavement. S. Gausmann. Elec Ry J 45:718-19 Ap 10 '15; Excerpt (Suggestions for concreting street railway track). Eng Rec 71: 534 Ap 24 '15
New track and conduit construction at Worcester, Mass. il Elec Ry J 46:325-6 Ag 21 '15
Non-splashing electric track switch. il Elec Ry J 45:1083-4 Je 5 '15
Pine ties reused by street railway after twenty-one years' service. R. C. Cram. Elec Ry J 45:295-6 F 6 '15
Practical views of special work—the tongue switch. R. P. Williams, diags Elec Ry J 46: 639-41 S 25 '15
Practice in paying street-railway tracks. il diags Eng N 73:888 My 6 '15

Practice in paying street-railway tracks. il diags Eng N 73:888 My 6 '15 Rail wear in Chicago. Elec Ry J 45:1195-6 Je 26 '15

Recommended street-railway track construction, il Eng N 74:846 O 28 '15 Reconstruction of street-car tracks at Kansas City, Mo. E. B. Murray, il Eng N 74:411-13 Ag 26 '15

Records of rail wear from vehicle traffic. Eng & Contr 44:42 Jl 14 '15

Relaying street-railway track at Cincinnati. il Eng N 74:362 Ag 19'15

Replaceable flange risers of tool steel in Seattle special work. J. Parkin. il diags plan Elec Ry J 44:1394-5 D 26 '14

Report of the committee of A. E. R. A. on way matters. diags Elec Ry J 46:752-4 O 9 '15

Street railroads-Track Continued

treet rangoads—Track Continued
Imping up street railway tracks, Eng N 73:
1134-5 Je 10 '15
Standard paved track construction of the
Southern public utilities co. il Elec Ry J 46:

Southern public utilities co. il Elec Ry J 46: 321-5 Ag 21 '1.0

Steel vs. wood ties in city track construction.
J. A. Nester. il Elec Ry J 46:1089 N 27 '15

Street-railway track in American cities. il Eng N 74:750-1 O 14 '15

Track construction and flangeways in paved streets. Eng Rec 71:405 Mr 27 '15

Track construction in paved streets. B. R. Brown. Elec Ry J 45:1028-9 My 29 '15

Track on concrete stringers. H. B. Nichols. Elec Ity J 16:102-3 S 4 '15

Track reconstruction in San Antonio. G. W. Smith. Elec Ry J 45:1030 My 29 '15

Track renewal discloses perfect condition of 14-year-old granite pavement in Worcester, Mass. il Eng Rec 72:229-30 Ag 21 '15

Track-trench excavating machine. il Elec Ry J 46:74 Jl 10 '15

Track work by contractor or way department?
S. Gausmann. Elec Ry J 45:895-6 My 8 '15

Tyard entrance track layout possibilities. S. Striezheff. diags Elec Ry J 46:76-7 O 23 '15

\*\*See also\* Electric railroads—Track; Street works by Conseiners. See also Electric railroads—Track; Street railroads—Crossings

## Traffic

Collection of traffic data. F. W. Doolittle. Elec Ry J 46:94-101 J1 17 '15
From traffic study to time-table. F. W. Doolittle. Elec Ry J 46:587-9 S 18 '15
Operating cost and shifts in service. F. W. Doolittle. Elec Ry J 46:306-8 Ag 21 '15
Organizing the traffic survey. F. W. Doolittle. Elec Ry J 45:1160-2 Je 19 '15
Periodical traffic counts. Elec Ry J 45:27 Ja 2 '15

2 '15
Plotting peak traffic as an aid to schedule adjustment, Elec Ry J 45:138 Ja 16 '15
Recent practice in traffic counts. D. J. Mc-Grath. Elec Ry J 44:1385-7 D 26 '14
Relieving traffic congestion, il Elec Ry J 45:
30-2 Ja 2 '15

Traffic analysis and schedule planning at Portland, Ore. F. Cooper. Elec Ry J 46:562-4 S land, 18 '15

18 '15 Traffic characteristics. F. W. Doolittle, il Elec Ry J 45:926-9 My 15 '15 Traffic characteristics and investment per rev-enue passenger. J. A. Emery. Elec Ry J 45: 1119-20 Je 12 '15 Traffic investigation in Denver. R. W. Toll. Elec Ry J 46:309-11 Ag 21 '15

# Trailer operation

Rochester train operation; operation of motor and trailer combinations has relieved traffic congestion in downtown section. diags Elec Ry J 45:752-3 Ap 17 '15

## Transfers

Printing 1,000,000 transfers a day; the Third avenue railway system prints its own transfers at a net cost of 9 cents per 1000. il Elec Ry J 45:702-4 Ap 10 '15 Transfer issuing machine. il Elec Ry J 46: 453-4 S 11 '15

# Valuation

Discussion of depreciation, P. J. Kealy. Eng & Contr 44:118-23 Ag 18 '15

# Yards

Yard entrance track layout possibilities. Striezheff, diags Elec Ry J 46:876-7 O '15

Street railroads, Municipal Boston versus Glasgow. Elec Ry J 46:443 S '15

Calgary's municipal street railway. W. E. Hardenburg. il Munic J 39:395-7 S 9 '15
Detroit purchase negotiations. Elec Ry J 45:

T25. Ap 10 '15
Municipal operation in England, A. N. Connett. Elec Ry J 45:179-80 Ja 23 '15
Municipal ownership in Seattle. Elec Ry J 44:
1311; 45:431 D 12 '14, F 27 '15

Municipal street railways. A. J. Cleary. il plan map Eng N 73:320-4 F 8 '15

Municipalization or a just regulation, a plea for the facts; abstract. J. W. Sullivan. Elec ky J 44:1290 D 12 '14 San Francisco municipal railways; annual re-port. Elec Ry J 45:1221 Je 26 '15

Street signs

Concrete street signs and standards—letters in colored concrete, il diag Concrete Cem 7:

Municipally made street signs. H. M. White, il Munic J 39:659 O 28 '15
Portland street corner directories. Munic J 39: 7 Jl 1 '15

Street-name signs, il Eng N 73:757 Ap 22 '15 Street signs placed in 1915. Munic Eng 48: 270 Ap '15

Street sprinkling
Electric street sprinklers, il Elec W 65:238 Ja
23 '15; Same, Eng Rec 71:117 Ja 23 '15 See also Street oiling

### Cost

Comparative cost of street sweeping and sprinkling with mules and with motors. Munic Eng 48:305 My '15 Cost of boulevard lighting and street sprinkling and flushing in Grand Rapids, Michigan. Eng & Contr 42:485-6 N 18 '14 Motor truck reduces sprinkling cost 70 per cent. Eng Rec 71:520 Ap 24 '15

Street sweepers. See Street cleaning apparatus Street traffic

Chicago takes a traffic census of the loop. Eng Rec 72:364 S 18 '15 investigation; Bridgeport, Conn. A. F. Muller. plan Eng N 73:111-12 Ja 21 '15

xample of traffic census, Euclid avenue, Cleveland. M. B. Greenough. Eng & Contr 43:502-3 Je 2'15 Example

At the contraction of the contra

Three years' growth of street traffic in New-ark, N. J. H. Bartholomew. Eng N 74:538-9 S 16 '15

Traffic census and its bearing on the selection of pavements. W. W. Crosby. Good Roads n s 10:265-6 N 6 '15 Traffic congestion problem in Brooklyn, N. Y. W. H. Messenger, il Munic Eng 48:19-25 Ja

Traffic control at electric railway crossings.
il Munic Eng 48:178-80 Mr '15
Traffic count on Chicago streets. Elec Ry J
46:632-3 S 25 '15

46:632-3 S 25 '15
Traffic investigation in Denver. R. W. Toll.
Elec Ry J 46:309-11 Ag 21 '15
Traffic regulation by zones marked on pavements. Munic Eng 48:221 Mr '15
Why local regulations of motor truck traffic are objectionable. Horseless Age 35:407-9
Mr 24 '15

See also Vehicles

Streets Boulevard system of San Francisco. J. M. Owens. map Eng N 74:498-9 S 9 '15

Chicago plan and the new heavy-traffic streets.
W. D. Moody. map Eng N 73:482-3 Mr 11 '15
City of Oakland, California, and its street
work. W. H. Jordan. il Good Roads n s 10:
127-32 S 4 '15

Cutting a city street through a railway station, Springfield, Mass. il diags plan Eng N 74: 296-9 Ag 12 '15

Heavy cut for a street at Kansas City. il diag Eng N 72:1158-60 D 10 '14

Streets --Continued

treets—Continued

New street line monuments at Pittsburgh.
diag Eng & Contr 43:574 Je 30 '15

Organization, character of personnel, scope
of work, and methods of operation and control of a large municipal highway department. W: H. Connell. il map J Fr Inst 179:
439-69 Ap '15

Proposed design for stub-end streets. H. C.
Campbell. diags Eng & Contr 44:350 N 3 '15

Protecting newly paved streets at Baltimore.
Eng N 73:55 Ja 14 '15

Scheme to relieve congestion at busy street
intersection. il Eng N 74:875 N 4 '15

Street contours at intersections and crosswalks. H. J. Fixmer. plan Eng N 73:767 Ap

22 '15

Street grade changed 19 ft. on Seattle line. il Elec Ry J 45:832 My 1 '15 Street grading in cities, 1915. Munic Eng 48:

257 Ap '15
\$3,000,000 needed for improving Boston's streets. Eng Rec 72:503-4 O 23 '15
Widening a business street at St. Paul, Minn. diag Eng N 72:1239 D 31 '14

See also Alleys; City planning; Dust prevention; Pavements; Roads; Sidewalks; Snow removal; Street cleaning; Street lighting; Street openings; Street traffic; Subways (streets); also names of cities, subhead

Bibliography

Streets; their arrangement, lighting and planning. T. Kimball. Special Libraries 6:42-8 ning.

Laws and regulations

Street work in New York. Munic J 39:3-4 Jl 1

Maintenance and repair

Street repair in Cleveland, Ohio; with cost tables. P. J. Masterson and others. il Munic Eng 49:174-8 N '15

Obstructions

Piling building material in city streets. J: C. Frautwine, jr. il Eng & Contr 43:377 Ap

Width

Narrow vs. wide paved roadways in residential districts. il Eng & Contr 44:148 Ag 25

Pavement widths and crowns, H. J. Fixmer, diag Good Roads n s 9:230-1 Je 5 '15; Cor-rection. 10:16 Jl 3 '15 Fixmer.

rection, 10.16 31 31 Wide streets and narrow walks and roadways in residential districts, N. P. Lewis. Eng & Contr 43:368 Ap 21 '15 Width and arrangement of residential streets

in a small English town. A. J. Price. Eng & Contr 42:158 Ag 12 '14 Width of bridges and highways. C: M. Spofford. Munic Eng 49:114 S '15

Width of residence streets. Munic J 38:290 Mr 4 '15

Stremmatograph

Instrument to determine the unit fiber strains in rails. P. H. Dudley. Gen Elec R 17:1043-6 N '14; Same. Sci Am S 78:370-1 D 12 '14

Strength of materials

rrength of materials
Failure of structural brasses. P. D. Merica
and R. W. Woodward. Metal Ind n s 13:45961 N '15 (to be cont)
Notch shock tests and the law of similarity;
abstract. R. Stribeck. diag Am Soc M E J
27:183-4 Mr '15 P. D. Merica

37:183-4 Mr <sup>15</sup>
Strength of metals vs. composition, E. A. Lewis. Metal Ind n s 13:201-2 My <sup>1</sup>5
Stucco board vs. standard built walls, il Bldg Age 37:67-8 Ap <sup>1</sup>15
Tests on the diagonal strength of boiler plate.
J. W. F. Macdonald. Power 41:779-80 Je 8

See also Architecture; Building; Building materials; Cast iron—Testing; Elasticity; Girders; Strains and stresses; Trusses; Wood

Strikes

Arizona copper miners' strike. il Eng & Min J 100:605-7 O 9 '15 Chicago's two-day strike. Elec Ry J 45:1165-8 Je 19 '15

Detroit strike. Elec Ry J 45:998 My 22 '15 Fort Wayne strike. Elec Ry J 46:684, 1004 O 2, N 13 '15

Wilkes-Barre again. Elec Ry J 46: Strike at 3 Wilkes-Barre, Pa. Elec Ry J 45:726 Strike

rike in W Ap 10 '15 Ap 10 '15 Strike of freight handlers in Boston. Ry Age 59:865 N 5 '15 Strike situation in Arizona. il Eng & Min J 100:731-3 O 30 '15 Strikes and lockouts—causes and effects. Am Ind 15:39 Mr '15 Syracuse strike settled. Elec Ry J 45:767 Ap

laboring classes; Open and closed shop; Picketing See also Arbitration, Industrial; Labor and

Stripping. See Hydraulic excavation

Strontium

Strontium in the beet sugar industry. H. C. Meyer. J Ind & Eng Chem 6:1036 D '14
Two methods of separation of the metals of the alkaline-earth group. A. G. Paterson. Am Chem Soc J 37:2346-52 O '15

Probable life of Portland cement stucco on metal fabric. Concrete Cem 7:151-5 O '15 Stucco in suburban architecture—notes on Ogontz Hill, Philadelphia. O. C. Hering. il Concrete Cem 6:9-14 Ja '15 Thin stucco finish on garden walls and buildings near Middleburg, Va. il Concrete Cem 6:24-5 Ja '15

Studebaker corporation, South Bend, Indiana

Unprecedented year for Studebaker corpora-tion. Horseless Age 35:289-90 Mr 3 '15 Student life. See College students

Study

Economy in study; psychological and physiological points on how to study to the best advantage. G: V. Dearborn, Sci Am S 80: 34-5 Jl 17 '15

Stumps. See Clearing of land

Subaqueous excavation. See Excavation, Subaqueous

Subdivision of ships. See Naval architecture-Subdivision

Submarine boats

Austrian submarines. il Sci Am 113:250 S 18

Baby submarine. Sci Am 113:316 O 9 '15 Boat design that eliminates bow waves and wake. C. Hering. il Sci Am 113:325 O 9 '15; Discussion (Waveless boat). 113:447 N 20

To Edison submarine boat storage battery. H. T. Wade. il Sci Am 112:450+ My 15 '15
First American submarine. C: Griswold. Sci Am S 79:333-4 My 22 '15
First electrically propelled submarine vessel. J. F. Waddington. Int Marine Eng 20:362 Ag '15

First German submarine. Sci Am 111:495 D 12 14

First 9 '15 Spanish submarine. Sci Am S 80:229 O

9 '15 German submarines U 8 and U 12. il Engineer 119:250 Mr 12 '15 Improvements in submarines. C. N. Hinkamp. Engineer 119:280 Mr 19 '15 Is there any defense against the submarine? Sci Am 112:152 F 13 '15 Loading and firing submarine torpedoes. Sci Am 112:493 My 29 '15

Logical results of the submarine torpedo boat. Eng N 73:1234-6 Je 24 '15

Look-out for submarines, Sci Am S 80:311 N 13 '15

Machinery of modern submarines. A. P. Chalk-ley. il Sci Am 113:26+ JI 3 '15

Modern submarine; features of the Holland, Laubeuf, Krupp and Laurenti types; ab-stracts. C. A. Ward. diags Eng M 49:96-9 Ap '15; Int Marine Eng 20:276 Je '15

Modern submarine in naval warfare. R. H. M. Robinson. il J Fr Inst 179:283-311 Mr '15; Same. Sci Am S 79:296-8, 312-14 My 8-15 '15

Modern submarine; methods of control. il Sci Am 113:16-17 Jl 3 '15

Submarine boats - Continued

Modern submarine torpedo boats of the United States and other navies. H. S. Howard. il plan Eng N 73:1222-3 Je 24 '15 Modern submarines in war and peace. S. Lake. il diags plans Int Marine Eng 20:286-94, 349-55, 399-494, 450-6, 502-6, 559-62 Jl-D '15 (to be cont); Excerpt. Eng M 50:104-7 O '15 Mother ship for submarines; a combined salvage and drydock vessel. R. G. Skerrett. diags Sci Am 112:430 My 8 '15 Motive power for submerged operation of submarines. Int Marine Eng 20:514 N '15 Periscope, the searching eye of the submarine. il Sci Am 112:355+ Ap 17 '15 Raising the F-4, J. F. Springer. il Sci Am 112:355+ Ap 17 '15 Raising the submarine F-4. J. A. Furer. il plan Eng N 74:880-4 N 4 '15 Reference list of parts of submarine. il Sci Am 113:336-7+ O 16 '15 Salving sunken submarines. il diag Sci Am S 79:232-3 An 10 '15

il Sci Am 113:336-7+ O 16 '15
Salving sunken submarines. il diag Sci Am S
79:232-3 Ap 10 '15
Submarine at sea. il Sci Am 112:310 Ap 3 '15
Submarine disaster at Honolulu. Sci Am 112:
336 Ap 10 '15
Submarine for hydrographic work. S. Lake. il
diag Sci Am 113:272-3 S 25 '15
Submarine for the Austro-Hungarian navy.
F: C. Coleman. il Sci Am 112:85 Ja 23 '15
Submarine periscopes. E. Coustet. il diags Sci
Am S 80:269-70 O 23 '15; Abstract. Eng M
S0:110-11 O '15
Submarine power plant. A. Hoar. il Sibley J

Submarine power plant. A. Hoar, il Sibley J 30:59-63 N '15

Submarine power piant. A. Hoar, it Sloley J 30:59-63 N '15
Submarine propulsion. P. H. Berggeen. Sibley J 30:71-2 N '15
Submarine to salve a submarine. R. G. Skerrett, il Sci Am 112:342 Ap 10 '15
Submarine torpedo-boat and its results. Eng N 73:945-6 My 13 '15
Submarines and torpedoes. C. N. Hinkamp. il plan Sci Am S 80:136-8 Ag 28 '15; Same cond. Engineer 120:19 Jl 2 '15; Same cond. Engineer 120:19 Jl 2 '15; Same cond. Eng N 74:698-9 O 7 '15
Submarines betrayed by sound waves. il Sci Am 113:333+ O 16 '15
Submarines that are strictly invisible. S. Lake. il Sci Am 112:68-9 Ja 16 '15
Submarines that crossed the ocean. Sci Am S 80:293 N 6 '15
Trials of the submarine tender Fulton: first United States naval vessel to be fitted with Diesel engines. il diag plans Int Marine Eng 20:76-8 F '15
See also Submarine warfare; Torpedo boats

See also Submarine warfare; Torpedo boats

Submarine diving. See Diving, Submarine

Submarine mines. See Mines, Submarine

Submarine signals Fessenden oscillator Fessenden C. Moffet senden oscillator to detect submarines, Moffett. Elec R & W Elec'n 66:738 Ap 17

Submarine signalling. Engineer 119:446 My 7 '15; Same. Sci Am S 80:168-70 S 11 '15 Submarine signalling and proposed method of safe navigation in fog: abstract. F. L. Sawyer. Int Marine Eng 20:21-2 Ja '15

Submarine warfare Blockade by submarine. Sci Am 112:376 Ap 24

Modern submarine in naval warfare. R. H. M. Robinson. il J Fr Inst 179:283-311 Mr '15; Same. Sci Am S 79:296-8, 312-14 My 8-15 '15 Modern-submarines in war and peace. S. Lake. il Int Marine Eng 20:502-6 N '15 Protection against torpedoes. Engineer 119:41-2 Ja 8 '15; Same. Sci Am S 79:107 F 13 '15 Stitch in time saves nine: defense against submarines. Sci Am 113:194 S 4 '15 Submarine as a commerce destroyer. il Sci Am 112:395 My 1 '15

Submarine catcher. il Sci Am 113:77 Jl 24 '15 Von Tirpitz and his navy. Sci Am 113:334 O 16

See also Mines, Submarine; Submarine boats

Sub-press. See Punching machinery

Subsidies

France to subsidize farm tractors, il Automobile 33:644-5 O 7 '15

Substations. See Electric plants—Substations; Electric railroads—Substations

Substitution (chemistry)
Substitution in the benzene nucleus. A. F.
Holleman. Am Chem Soc J 36:2495-8 D '14 Subsurface structures. See Subways (conduits)

Suburban houses

Suburban house of stucco finish, il diags plans Bldg Age 37:42-5 Ag '15

Subway cars. See Cars, Subway

Subway stations

Downtown union subway station, New York city. il Eng N 74:333 Ag 12 '15

Station entrances on Boston subways. W. B. Conant. il Munic Eng 49:13-14 Jl '15

Subway timbering

ubway timbering Comparative timbering costs in mine and subway, diag Eng & Min J 100:689-90 O 23 '15 Mine-timbering methods and falls of ground. Eng N 74:853 O 28 '15 Not merely mining but bridge building; the importance of diagonal bracing in subway timbering. il diags Sci Am 113:324 O 9 '15 Proper timbering would have prevented subway collapse. J: Seward. Eng N 74:758-9 O 14 '15

way conapse. J: Seward. Eng N 74:763-9 O 14 '15
Public-service engineers on New York subway accidents. Eng N 74:762-3 O 14 '15
Recommendations for safety of subway timbering. Eng N 74:716 O 7 '15
Respecting subway timbering. Eng & Min J 100:610-11 O 9 '15
Special subway timbering on section 1, Lexington ave. route, New York. diag Eng N 72: 1218-19 D 17 '14
Steel support of decking gives large clear space for subway work. il diag Eng Rec 72: 57-8 J1 10 '15
Subway timbering accidents; two New York streets fall. il diags Eng N 74:662-6 S 30 '15
Timbering in New York subway. J: Seward. Eng & Min J 100:890-1 N 27 '15
Timbering in New York subway. J: Seward. P. E. Barbour. Eng & Min J 100:686-7 O 23
Timbering in the New York subway. P. E.

Timbering in the New York subway. P. E. Barbour, il diags Eng & Min J 100:568-70 O 2 '15

Subways

Brooklyn bridge subway connection, New York city. il map Eng Rec 71:76-7 Ja 16 '15
Detail and fabrication of Harlem river tubes.
T: Duckworth. il diags Eng Soc W Pa 31: 538-60; Discussion. 31:560-83 O '15
Every type of subway construction but air tunnel used on Harlem river section. il plans Eng Rec 71:616-19 My 15 '15
Extension of the Bakerloo tube. il plans map Engineer 119:29-31, 56-8, 92-4 Ja 8-22 '15
Harlem river four-track subway tunnel. O. Hoff. il diags map Eng Soc W Pa 31:517-37; Discussion. 31:571-83 O '15
Heavy needling for 450-ton column loads for subway underpinning. il diags Eng Rec 71:565-6 My 1 '15
Lap-bolted crossbracing in wide and deep cut.

Heavy needing for 450-ton column loads for subway underpinning, il diags Eng Rec 71:565-6 My 1 '15
Lap-bolted crossbracing in wide and deep cut. if diag Eng N 74:602 S 23 '15
Methods used to protect the foundation of a heavy tower during adjacent subway construction in Boston. diag Boston Soc C E J 1:408-14 S '14; Same. Eng & Contr 42:604-5 D 30 '14

New York rapid transit railway extensions. F. Lavis. diags Eng N 72:782-7, 858-63, 950-2, 972-8, 1068-71, 1104-9, 1150-5, 1206-10, 1294-8 O 15, 29-N 12, 26-D 17, 31 '14

New York subway tapped for new connections while carrying heavy traffic, il diags plan Eng Rec 72:255-7 Ag 28 '15

New York transit contracts. Eng Rec 70:662 D

Progress on the dual subway system, New York city. Ry R 56:118-19 Ja 23 '15

Railroads under and over the streets of New York. il diags map Sci Am 113:46-7+, 64-5+, 96-7+ Jl 10-17, 31 '15

Short subway section in New York involves many difficulties of design. J. Glaser. il diags Eng Rec 71:448-51 Ap 10 '15

Signals for new Brooklyn subways. Ry Age 57: 1191 D 25 '14

Subways toutinued

ubways Unitimed
Slice method of subway construction, Boylston
street subway, Boston, Mass. il diags Ry
R 56:621-4 My 8 '15
Soil tests reported and safe underpinning
methods in sand described. J: F. Greathead,
diags Eng Rec 72:631-3 N 20 '15
Starting six tubes for two new East river subway crossings in New York, il diags Eng
Rec 71:810-12 Je 26 '15
Steel shields protect traffic during removal of
New York subway roof, il Eng Rec 72:110-12
Jl 24 '15

New York subway roof, il Eng Rec 72:110-12 Jl 24 '15 Subway undercrossing walls concreted from the top down, il diag Eng Rec 72:25-6 Jl 3

Tearing out a reinforced-concrete subway, New

York city, il Eng N 72:1126-7 D 3 '14 Unexcavated core is left in center in sinking circular subway shaft, il diags Eng Rec 71:522-3 Ap 24 '15

See also Subway stations; Subway timbering; Tunnels and tunneling

### Accidents

Collapse of street decking follows subway blast. il Eng Rec 72:397, 400 S 25 '15 Collapse of streets in New York city during subway construction. il Ry R 57:434 O 2 '15 Collapse of the subway work on Seventh avenue, New York city. il Sci Am 113:295 O 2

Danger of collapse in subways is not general. F. Lavis. Eng N 74:666-7 S 30 '15
Disastrous burnout in a subway manhole, New York city. Sci Am 112:66 Ja 16 '15
Dynamite explosion causes new subway cavein in New York. il Elec Ry J 46:631-2 S 25 '15

Not merely mining but bridge building; the importance of diagonal bracing in subway timbering, il diags Sci Am 113:324 O 9 '15 Public-service engineers on New York subway accidents. Eng N 74:762-3 O 14 '15 Rock slide causes second collapse of subway decking, in New York city. Eng Rec 72: 429+ O 2 '15

429+ O 2 '15
Rock slides greatest menace to New York subway work; report of E. S. Davis and H: H. Quimby. Eng Rec 72:461+ O 9 '15 Safety in subway construction. Eng N 74:657-8 S 30 '15

Safety in subway construction. Eng Rec 72:405 O 2 '15

Severe cable burnout in the subway, New York city. Eng N 73:93 Ja 14 '15 Subway fire inquiry and orders. Elec Ry J 45: 148-9 Ja 16 '15

148-9 Ja 16 '15
Subway timbering accidents; two New York
streets fall. il diags Eng N 74:662-6 S 30 '15
Timbering in the New York subway. P. E.
Barbour. il diags Eng & Min J 100:568-70 O
2 '15

Unjust criticism of the subway system of New York. Sci Am 112:62 Ja 16 '15

## Safety devices and measures

Increasing safety of rapid transit in New York city. Eng N 73:236 F 4 '15
Safety conditions in Boston subways. Elec Ry J 46:159-60 Jl 24 '15
Safety precautions in New York subway; report made to the mayor by the city fire department; abstracts. Elec Ry J 46:601 S 18 '15; Eng N 74:572 S 16 '15

## Ventilation

Extension of the Bakerloo tube, il plans Engineer 119:92-3 Ja 22 '15
Proposed subway ventilators. Metal Work 83: 270-1 F 12 '15
Subway ventilation. J. G. Dudley, plan Heat & Ven 12:42-3 O '15

Subway ventilation schemes, il diags Heat & Ven 12:13-16 Ag '15

Subways (conduits)
Chicago builds its first utility gallery, plan
Eng Rec 72:593-4 N 13 '15

Comparative merits of four types of location of underground utility lines. L: A. Dumond. Eng & Contr 44:357-9 N 3 '15

Design and construction features of Chicago's first utilities gallery, il diags Eng & Contr 44:376-7 N 10 '15

How shall provision be made for subsurface structures? Eng Rec 70:683 D 26 '14

structures? Eng Rec 70:683 D 26 '14
Pipe subways for the public utilities of Chicago. L: A. Dumond. Eng Rec 70:705-6 D 26

T4
Subways for public-utility pipes and wires in Chicago streets. Eng N 73:60-1 Ja 14 '15; Same. Am Gas Light J 102:76 F 1 '15
Underground utility galleries for downtown Chicago. J: W. Alvord and C. B. Burdick. Eng Rec 71:53-4 Ja 9 '15

Subways (streets)

Cutting a city street through a railway station, Springfield, Mass. il diags plan Eng N 74:296-9 Ag 12 '15

Difficult grade crossing elimination in Albany, N. Y. il diags plan Ry Age 59:961-3 N 19 '15 Factors in grade separation, Eng N 73:422-3 Mr 4 '15

Methods and costs of constructing Bay street underpass at Macon, Ga. C. H. Fuller. il diags Concrete Cem 6:75-8 F '15

## Success

How to fail, F. D. Van Amburgh, Metal Work 83:500-1+ Ap 2 '15; Same, Dom Eng 71: 187-9 My 15 '15 Measure of success—responsibility, Sibley J 29:166-9 F '15

See also Leadership

### Sucrose

Direct and the invert polarization of pure sucrose, H. S. Walker, J Ind & Eng Chem 7:216 Mr '15

Suction between passing ships. S. A. Reeve. diags Sci Am S 79:30-2, 46-8, 62-4 Ja 9-23 '15

Sudan, Egyptian
Development of the Sudan, il map plans diags
Engineer 119:271-4 Mr 19 '15

or Combustion calorimetry and the heats of combustion of cane sugar, benzoic acid, and naphthalene. H. C. Dickinson. bibliog U S Bur Stand Bul 11:189-257 Mr 1 '15 Contributions of the chemist to the sugar industry. W. D. Horne. J Ind & Eng Chem 7: 278-9 Ap '15

Efficiency of various methods for the filtration

of sugar solutions. A. E. Roberts. diags J Ind & Eng Chem 6:986-9 D '14 Transforming sugar into proteins and fats. H. W. Hillyer. Sci Am 113:446+ N 20 '15

See also Beets and beet sugar; Glucose; Syrups

### Manufacture

Engineer of modern sugar plantation has to deal with varied problem; plant of Niquero company in Cuba. S: Vickess. il plan map Eng Rec 72:534-6 O 30 '15

Performance tests of sugar-house heating and evaporating apparatus. E. W. Kerr, J. F. Gunther and W. A. Tolsten. diags Met & Chem Eng 13:485-92, 506-7 Ag '15 Sugar industry. C. A. Kelsey. Am Inst E E Pro 34:3039-44 D '15

Sugar beet. See Beets and beet sugar

Sugar maple. See Maple

Sugars
Hydrolysis of sugar solutions under pressure

W. S. Hubbard and W. L. Mitchel. J Ind & Eng Chem 7:609-10 Jl '15 Volumetric Fehling method using a new indi-cator. A. M. Breckler. J Ind & Eng Chem 7: 37-8 Ja '15

Sec also Maltose

Sulfur. See Sulphur

## Sulphates

Determination of sulfates in soils. P. E. Brown and E. H. Kellogg. J Ind & Eng Chem 7: 686-7 Ag '15

Formation and decomposition of sulphates during roasting. B. Dudley, jr. Met & Chem Eng 13:221-6, 303-8 Ap-My '15

Sulphides

Action of thionyl chloride on sulfides. H. B. North and C. B. Conover. Am Chem Soc J 37:2486-90 N '15

Cyanidation of low-grade sulphide ores in Colorado. H. C. Parmelee. il plan Met & Chem Eng 13:421-5, 477-9 Jl-Ag '15

Sulphides -Continued

ulphides—Continued
How sulphides may exist in steel ingots. J. O. Arnold and G. R. Bolsover. Iron Tr R 57: 737-8 O 14 '15; Discussion. G. F. Comstock, Iron Tr R 57:894+ N 4 '15
Origin and occurrence of certain crystallographic intergrowths. J. Segall. 2 pls Econ Geol 10:462-70 Jl '15
Oxidation of sulfides with potassium iodate. R. S. Dean. Am Chem Soc J 37:1134-7 My '15
Processes of mineralization and search of the second control of the search of

Processes of mineralization and enrichment in the Tintic mining district. W. Lindgren. 2 pls Econ Geol 10:225-40 Ap '15
Rate of reduction of acidity of descending waters by certain ore and gangue minerals and its bearing upon secondary sulphide enrichment. G. S. Nishihara. il Econ Geol 9:743-57 D '14

enrichment. G. S. Mishhara, il Econ Geol 9:743-57 D '14 Sulphide-bearing rocks from Litchfield, Conn. E. Howe, diags Econ Geol 10:330-47 Je '15 Treatment of arsenical-antimonial sulphide ore; abstract. K. B. Moore and H. R. Ed-mands. Met & Chem Eng 13:508-9 Ag '15

See also Chalcocite

Sulphite-solution plant. See Paper making and trade

Sulphonates

Study of the reaction of alkali salts of sulfonic acids with alkali phenolates by dry distil-lation, E. H. Nollau and L. C. Daniels. Am Chem Soc J 36:1885-91 S '14

Sulphonation

Addition compounds of organic substances with sulfuric acid. J. Kendall and C. D. Car-penter. Am Chem Soc J 36:2498-517 D '14

Sulphur

sulphur. R. A. Pitman.

Blow holes and Supplied Foundry 43:95-6 Mr '15 Foundry 43:95-6 Mr '15 Comparative study of methods for the quanti-comparative study of sulfur in peptone.

Comparative study of methods for the quantitative determination of sulfur in peptone. H. W. Redfield and C. Huckle. Am Chem Soc J 37:607-11 Mr '15
Controlling the sulphur in melting pig iron. W. M. Carr. Foundry 43:189-90 My '15
Equilibrium between carbon oxysulfide, carbon monoxide and sulfur. G. N. Lewis and W: N. Lacey. diag Am Chem Soc J 37:1976-83 S '15

83 S '15
Estimation of selenium in sulfur. W. Smith.
J Ind & Eng Chem 7:849-50 O '15
Free energy of the various forms of elementary sulfur. G. N. Lewis and M. Randall. Am Chem Soc J 36:2468-75 D '14
Molecular weight of sodium sulfate and the atomic weight of sulfur. T. W: Richards and C: R. Hoover. Am Chem Soc J 37:108-13 Ja '15
Origin of the sulphur describes of Significant Control of Significant Contro

Origin of the sulphur deposits of Sicily. W. F. Hunt. il Econ Geol 10:543-79 S '15
Production of elemental sulphur. C: H. Fulton. U S Bur Mines Bul 84:70-7 '15
Quantitative determinations of sulfur in the

culture medium for the detection of the bac-teria producing hydrogen sulfide. H. W. Redfield and C. Huckle. Am Chem Soc J 37: 612-23 Mr '15

612-23 Mr '15
Recent methods for the determination of total sulphur in rubber. J. B. Tuttle and A. Isaacs. U S Bur Stand Tech Pa 45:1-16 '15; Same. J Ind & Eng Chem 7:658-63 Ag '15
Recovery of elemental sulphur. Eng & Min J 100:229 Ag 7 '15
Results of some co-operative work on determination of sulfur in pyrites. H. C. Moore. J Ind & Eng Chem 7:634-6 Jl '15
Sicilian sulphur industry. Eng & Min J 100; 466-7 S 18 '15

Sulphur as a conductor. C. A. Butman. Elec  $\stackrel{.}{\mathrm{W}}$  64:1256 D 26 '14

Sulphur in coal. Elec W 65:350-1 F 6 '15

Sulphur in malleable cast iron. R. H. Smith. Iron Age 96:1235 N 25 '15

Sulphur dioxide Effect of sulphur dioxide on human beings. Eng & Min J 100:885-6 N 27 '15

Exact determination of sulphur dioxide in air. J. R. Marston. Eng & Min J 100:726-7 O 30

Methods for removal of sulphur dioxide from smelter smoke. C: H. Fulton, il U S Bur Mines Bul 84:65-7, 77-82 '15

Range of applicability of the liquid sulphur dioxide method for determining aromatic constituents in hydrocarbon mixtures. W. F. Rittman and R. J. Moore. diag Met & Chem Eng 13:713-14 O 15 '15 Report of the Selby smelter commission. J Ind & Eng Chem 7:41-5 Ja '15; Same cond. Eng & Min J 98:1075-8 D 19 '14

Sulphur Springs, Arkansas Spring deposits at Sulphur Springs, Ark. C. E. Siebenthal. Econ Geol 9:758-67 D '14

Sulphuric acid

Absorption of gasoline vapor in natural gas by fuming sulfuric acid. R. P. Anderson and C. J. Engelder. J Ind & Eng Chem 6:989-92 D '14

D 14
Addition compounds of organic substances with sulfuric acid. J. Kendall and C. D. Carpenter, Am Chem Soc J 36:2498-517 D '14
Apparatus for the concentration of sulphuric acid. W: Mason, diags Met & Chem Eng 13:17-18 Ja '15

acid. W: Mason. diags Met & Chem Eng 13:17-18 Ja '15
Comparison of the relative drying powers of sulfuric acid, calcium chloride and aluminum trioxide when used in ordinary Scheibler desiccating jars. J. W. Marden and V. Elliott. J Ind & Eng Chem 7:320-1 Ap '15
Fused silica dishes for 'the concentration of sulphuric acid. A. E. Marshall. diag Met & Chem Eng 13:136-7 Mr '15
Manufacture of sulphuric acid from smelter smoke. C: H. Fulton. il plan U S Bur Mines Bul 84:67-70 '15
Sulphuric-acid manufacture in Great Britain. Eng & Min J 99:438 Mr 6 '15

Causes of solar heat. A. Veronnet. Sci Am S 79:91 F 6 '15 Flammarion talks on the sun. Sci Am 112:146-

Sun drawing water. Sci Am 112:66 Ja 16 '15 See also Electricity, Solar; Solar power plants; Solar radiation

Sun dials. See Sundials

Sun power plants. See Solar power plants

Sundials

Universal sun-dial, il Sci Am 112:246 Mr 13

Sunflowers

Lightest known vegetable substance. Sci Am 113:450 N 20 '15

Superheated ammonia

Effect of superheated ammonia on compressor capacity. H. R. Howell. Power 42:646-7 N 9

Superheated steam

Specific heat of superheated steam at pressures from 8 to 20 atmospheres, and from temperature of saturation to 380 deg. cent.; abstract. O. Knoblauch and A. Winkhaus. Am Soc M E J 37:409-10 Jl '15
Specifications for alloys for high-speed superheated steam turbine blading. W. B. Parker, il Engineer 120:441-3 N 5 '15
Superheat for Corliss engines. E. R. Pearce. Power 40:886 D 22 '14
Superheat in vertical fire-tube boilers. S. P. Stewart. Power 42:582-6 O 26 '15
Superheated steam in torpedo-boat engines. W. H. Miller. Sci Am 112:33+ Jl 3 '15
Superheated steam unit; some remarkably economical German engines. W. H. Miller. il Sci Am 112:290-1+ Mr 27 '15
Use of superheated steam. L. P. St. Cyr. Power 42:87-8 Jl 20 '15
What causes the high efficiency of locomobiles?

What causes the high efficiency of locomobiles? E. R. Pearce, Power 41:633 My 11 '15; Same (Superheated steam engines) Sci Am S 80: 304 N 6 '15

Superheaters

Lovekin marine boiler and internal super-heater. A. B. Willits. diags Power 42:293-5 Ag 31 '15

Robinson marine superheater, il diags Engineer 119:286-7 Mr 19 '15

See also Locomotives-Superheaters

Supersaturated solutions. See Solutions, Supersaturated

Surface combustion. See Combustion, Surface Surface tension. See Capillarity

Surge tanks

urge tanks
Concrete surge tank, disconnected at base, operates on differential principle, il diag Eng Rec 71:368-70 Mr 20 '15
Results with a novel surge tank, diag Eng N 73:687 Ap 8 '15
Tail-tunnel regulation suggests new opportunitial in the production folds. P. D. John

all-tunnel regulation suggests new opportunities in hydroelectric field. R. D. Johnson. Eng Rec 71:380 Mr 20 '15 ests check computed values of surges; investigations at Tallulah Falls hydroelectric plant in Georgia indicate accuracy of formulæ commonly used. E. Lauchli, diag Eng Rec 71:378-9 Mr 20 '15 Tests

Surgery

New method of disinfecting wounds. Sci Am S 80:111 Ag 14 '15 Prehistoric man and his early efforts to combat disease. T. W. Parry. il Sci Am S 78:365-6

Ree also Anesthetics; Bandages and bandaging; First aid in illness and injury; Fractures; Surgery, Military; Surgical instruments; Wounds

Surgery, Military Mechanics of

urgery, Military
Mechanics of convalescence; methods of
hastening the cure of German wounded soldiers. W. Bannard. il Sci Am 112:404 My 1 '15
Military surgery. Sci Am 113:176 Ag 28 '15
Military surgery: lessons taught by the present
war. Sci Am S 79:54 Ja 23 '15
Roentgenology in war. il Sci Am S 79:68 Ja 30
'15

X-Ray work in war, il Sci Am S 79:120-1 F 20 '15

Surgery, Primitive

Progress of surgery as shown by military medical service in ancient times. N. Lallié. il Sci Am S 80:356-7 D 4 '15

Surgical instruments

urgical instruments
Electro-magnet for removing particles of iron
from the flesh, il Mach 21:601 Mr '15; Elec
R & W Elec'n 66:508 Mr 13 '15; Iron Age 95:
452 F 25 '15; Iron Tr R 56:525 Mr 11 '15;
Sci Am S 79:168 Mr 13 '15
Use of the Hughes induction balance for locating bullets, diag Elec W 65:167 Ja 16 '15

Survey markers

Practice in city survey monuments and bench-marks. Eng N 73:269-70 F 11 '15

Surveying

Aids to traverse computations, H. Andrews. Eng N 74:940-1 N 11 '15

Coiling a long tape by figure-eight method. H. N. Bradstreet. Eng N 73:939 My 13 '15

Computation of survey traverses. H. Andrews. Eng N 74:268-9 Ag 5 '15

Do surveyors use traverse tables? Eng N 73: 1038-9 My 27 '15

Examples of stadia surveying and its broader uses with special reference to preliminary hydraulic surveys. W. B. Saunders. Eng & Contr 43:570-2 Je 30 '15

History of steel tapes. Eng N 72:1316-17 D 31

Land classification surveys of irrigable tracts. K. A. Heron. Eng N 73:1039 My 27 '15

Method and cost of making a drainage survey for the Washington Bayou drainage district, Mississippi, O. W. Melin, map Eng & Contr 44:92-5 Ag 4 '15

More about traverse tables and survey computations. E. E. Thum. Eng N 74:124-5 Jl 15

New street line monuments at Pittsburgh, Pa. diag Eng & Contr 43:574 Je 30 '15

Notes on errors in survey work, A. W. Bedell, Eng N 72:1171 D 10 '14; Same, Eng & Min J 99:14-15 Ja 2 '15

Practice in city survey monuments and benchmarks. Eng N 73:269-70 F 11 '15

Record leveling on geodetic survey. W: Bowie. Eng Rec 71:807 Je 26 '15

Simple method of cross-sectioning employed on ditch work. B: L. Parker. Eng & Contr 43: 443 My 19 '15

Solar declinations computed by graphic method. R. R. V. Reynolds. Eng Rec 72:160 Ag 7 '15

Supplementing the Canadian public land surveys by rapid stadia work, J. A. Macdonald. Eng N 73:399-400 F 25 '15

See also Civil engineering; Mine surveying; Railroad engineering; Railroad surveying; Steel tape; Surveying instruments; Topo-graphical drawing

Surveying, Hydrographic. See Hydrographic sur-

Surveying, Magnetic. See Magnetic surveying

Surveying, Mine. See Mine surveying

Surveying, T surveying Topographical. See Topographical

Surveying

Surveying instruments

Account of micrometers for measuring distances. J. Watt. Eng N 73:471 Mr 11 '15

New features in surveying instruments. il Eng N 74:198-200 Jl 29 '15

New Smith-solar attachment. A. D. Kidder. il Eng N 73:1068-70 Je 3 '15

Quick solar reduction by slide rule. il Eng N 74:267 Ag 5 '15; Same. Eng & Min J 100: 353 Ag 28 '15

Testing surveyors' tapes by the Canadian gov-

Testing surveyors' tapes by the Canadian government. J. A. Macdonald, il Eng N 74:414-15 Ag 26

See also Compass; Stadiagraph; Transit, Surveyors'

Surveyors

Licensing land surveyors in the Canadian prov-inces. J. A. Macdonald. Eng N 73:1168 Je 17 '15

Suspended railways

Aerial monorail; Mähl system for high speed
suspended electrical trains, il Sci Am 112:
292. Mr 27 '15

See also Cableways; Telpherage

Suspension bridges. See Bridges, Suspension

Swasey, Ambrose, 1846Donor of the initial gift to the Engineering foundation. Am Soc M E J 37:vii-viii F '15 Engineering foundation established. por Iron Age 95:289-90 F 4 '15 Engineering foundation started with \$200,000 gift. por Eng Rec 71:153-4 Ja 30 '15 Foundation rests on broad ideas. por Iron Tr R 56:289-90 F 4 '15

Swedish wrought iron. See Wrought iron

Sweeping machines Small sweeping machines for power and hand operation. il Eng N 74:727 O 14 '15

Sweet, John Edson, 1832-John Fritz medal award. por Am Soc M E J 37:36-8 Ja '15

Swimming pools

Concrete natatorium for Chicago school chil-dren. plan Dom Eng 72:229 Ag 21 '15 Construction, mechanical installation, water Construction, mechanical installation, water supply, heating the water, various types of installations. A. G. King. diag Dom Eng 69:63-5, 126-8, 189-91, 264-6, 318-20; 70:34-5, 101-2 0 17, 31, N 14, 28, D 12 '14, Ja 9, 23 '15 Construction of concrete swimming pool at Rockledge, Florida, il diags Concrete Cem 6:148-9 Mr '15 Design features of reinforced concrete swimming pool at Riverview park, Chicago, plan Eng & Contr 44:357 N 3 '15 Details of an open-air swimming pool. il diag Bidg Age 37:51-2 My '15

Disinfection of swimming pools with copper sulphate. Sci Am S 80:352 N 27 '15

Municipal swimming pool, Grand Rapids, Wis. Eng N 74:821 O 28 '15

Natatorium in the Evander Childs' high school,

New York city. E. R. Porter, plans Dom Eng 73:134-7 O 30 '15

Plumbing equipment of swimming pool, Louis-ville, Ky. il plan Metal Work 83:288-90 F 19 '15; Same. Bldg Age 37:39-40 Jl '15

Plumbing work in Harvard club of New York. il plan Metal Work 84:605-7 N 12 '15

St. Louis builds large swimming pool. diags Metal Work 83:727 My 21 '15 Salt water swimming pool at Salem, Mass. il Munic J 39:224 Ag 12 '15

South side bath house, Pittsburgh, Pa.; views and plans. Brickb 24:pl 101-2 Jl '15

Swimming pools -Continued

wimming pools—Continued
Swimming pool building for Helen Miller Gould,
Irvington, N. Y.; views and plans. Arch Rec
38:171-6 JI '15
Swimming pool of Pittsburgh athletic club.
il Metal Work 84:522-3 O 22 '15
Use of copper sulfate in the purification of
swimming pools. S. J. Thomas. J Ind & Eng
Chem 7:496-9 Je '15
Wealthy Californian's swimming pool de luxe.
il plan Metal Work 83:796-8 Je 4 '15

Swine

Transportation

Cooling hogs in transit, diags Ry Age 58:752

Swing bridge. See Drawbridges

Swiss commercial and industrial association Commercial organizations in Switzerland. A. J. Wolfe. U S Bur For & Dom Com 101:13-17 '15

Switchboards

witchboards
Alternating-current switchboard costs. J. Wilmore. diags Elec W 66:414 Ag 21 '15
Barrier cutout panels and cabinets. il Elec R & W Elec'n 67:772 O 23 '15
Concrete switchboard. J. R. Chapman. il Power 42:311 Ag 31 '15; Same. Eng & Min J 100: 476-7 S 18 '15
Cutler-Hammer charging panels. il Elec R & W Elec'n 67:732-4 O 16 '15
Furnishing electric service in Louisville for \$2.99. il Elec R & W Elec'n 67:319-20 Ag 21 '15

Incident that shows the importance of correct synchronizing connections, E. C. Parham. Elec W 66:756 O 2 '15
Indicating thermometers part of switchboard equipment, il Elec W 65:421 F 13 '15
Method of anchoring and tightening switchboard instrument buses. C. H. Sanderson, diags Elec W 66:753 O 2 '15
New toll switchboard for Tampa, il Elec R & W Elec'n 65:1230 D 26 '14
Panel box for industrial plants. C: J. Whitfield, diags Elec W 66:73-4 JI 10 '15
Power plant of new Lumber exchange building, Chicago, T: Wilson, il Power 41:769-70
Je 8 '15

Recent developments in switchboard apparatus. E. H. Beckert. il diags Gen Elec R 18:646-57 Jl '15

Supplying of power to the Quaker oats company. J. M. Drabelle. il diag Gen Elec R 18: 42-4 Ja '15

Switchboard fittings, il Elec Ry J 46:835-6 O 16 '15

Switches, Ra frogs, etc. Railroad. See Railroads-Switches,

Switzerland

See also Electric railroads-Switzerland

## Commerce

Commercial organizations in Switzerland and the Swiss department of commerce. A. J. Wolfe. U S Bur For & Dom Com 101:1-28 '15

Commerce, Department of

Commercial organizations in Switzerland and the Swiss department of commerce, A. J. Wolfe, U.S. Bur For & Dom Com 101:20-6

Symbols, Electric. See Electric symbols

Symbols, Foundry. See Foundry symbols Symbols, Mnemonic

Efficiency in the stores department. W. G. Astle, Elec Ry J 46:907 O 30 '15; Same cond. (Storeroom organization and management). Iron Age 96:458-60 Ag 26 '15; Same cond. Metal Work 84:333-4 S 10 '15

Operating a foundry on a scientific b F: A. Parkhurst. Foundry 42:479-86 D

Pattern storage systems for factories. J: G. Shirley. Iron Age 96:304-5 Ag 5 '15

Synchronous converters. See Rotary converters Synchroscopes

Electrostatic potential and synchronism indi-cators. il Elec Ry J 46:326 Ag 21 '15; Elec R & W Elec'n 67:251-2 Ag 7 '15; Elec W 66: 310-11 Ag 7 '15; Power 42:271-2 Ag 24 '15

Large synchroscopes facilitate station opera-tion at Springfield, Mass. il Elec W 65:1251 My 15 '15

Synthetic stone. See Concrete stone

Synthetic stones. See Precious stones, Synthetic Syria. See Railroads-Syria

Syrups

Hydrolysis of sugar solutions under pressure.
W. S. Hubbard and W. L. Mitchel, J Ind
& Eng Chem 7:609-10 Jl '15
Tamarind syrup, W. C. Taber, J Ind & Eng
Chem 7:607-9 Jl 15

See also Apple syrup

T

Tabulating machines. See Calculating machines

Tachograph Records of speed variation. F. B. Steele. il Elec W 65:1687-8 Je 26 '15

Tachometers

achometers
Electric tachometer. il Eng M 48:sup4-5 F '15
Esterline electric speed indicator. il Elec R &
W Elec'n 66:829-30 My 1 '15; Elec Ry J 45:
897 My 8 '15
Portable triple-scale electric tachometer. il
Elec W 66:487-8 Ag 28 '15

Tahiti

Historical listorical sketch, resources and social life. E. T. Allen, il Am For 20:870-80 D'14

Chart for determining tailings value. W. J. McCauley. Eng & Min J 99:575 Mr 27 '15 Elevating placer tailings with a Hayward bucket. H. I. Ellis. Eng & Min J 100:309-10 Ag 21 '15

21 '15 Character tailings mill. W. C. Prosser. il Eng & Min J 99:607-8 Ap 3 '15 Multiple-arch dam to retain quartz mill tailings. il Eng N 73:818-19 Ap 29 '15 Recovery of mercury from amalgamation tailings, Buffalo mines, Cobalt. E. B. Thornhill. flow sheet Am Inst Min E Bul 104:1653-7 Ag '15; Abstracts. Met & Chem Eng 13:873, 896 N 15-D 1 '15; Discussion. Am Inst Min E Bul 108:2455 D '15 Roasting and leaching concentrator slimes tailings. L. Addicks. il flow sheet Am Inst Min E Bul 103:1471-84 Ag '15; Same Met & Chem Eng 13:531-5 S 1 '15; Discussion. Am Inst Min E Bul 108:2460-4 D '15

Talc and soapstone in 1914. Eng & Min J 100: 435 S 11 '15

Tamalpais, Mt.
Tackling Tamalpais. F: E. Olmsted. il Am For 20:887-93 D '14

Tamarinds Tamarind syrup. W. C. Taber. J Ind & Eng Chem 7:607-9 Jl '15

Tamping machines

Mechanical trench tamping. W. A. Kellogg. il Munic Eng 49:39-40+ Jl '15 Pneumatic tie tamper. il Ry Age 58:473-4 Mr 12 '15

Pneumatic track tamping. il Eng Rec 70:689 D

26 '14 Tamping track with air power, il Eng N 72: 1219 D 17 '14

Tank cars

Carriers must furnish tank cars. Ry R 56:855-6 Je 19 '15 Handling of fuel oil in extreme climatic con-ditions; abstract. Am Soc M E J 37:420 Jl

Tank ships Conversion of cargo vessels into bulk oil carriers. F. K. Ruprecht. diags Int Marine Eng 20:165-6, 212-16, 258-9, 309-11, 340-3, 404-6 Ap-

Evolution of the oil tank ship; abstracts. H. Barringer. Engineer 119:560 Je 4 '15; Int Marine Eng 20:417 S '15

Tank ships -Continuéd

ank ships —Continuéd Launch of the Gulfcoast, il Int Marine Eng 20: 199 My '15 Motor boat Kern, il plan Int Marine Eng 20: 489 N '15 Tank ship construction. R. W. Morrell, diags Int Marine Eng 19:532-4; 20:26-9, 71-3 D '14, Ja-F '15

See also Gulflight

Calibration charts for Vanderbilt tenders. T. Price. Ry Age (Mech ed) 89:563-5 N '15 Calibration curve for horizontal cylindrical tanks. Met & Chem Eng 13:511 Ag '15 Capacity of cylindrical tanks; a rapid means of determining the contents of tanks of all of the usual lengths and diameters. Horseless Age 36:76 Jl 21 '15

See also Coal tanks; Hot-water tanks; Septic tanks; Sewage tanks; Surge tanks; Tank cars; Tank ships; Water tanks

Tanks, Concrete

anks, Concrete
Concrete tanks for dye-houses, L. C. Wason;
W: M. Kinney. Concrete Cem 6:159 Mr '15
Concrete tanks for dye houses, R. R. Newman.
Concrete Cem 7:32 Jl '15
Concrete vats and tanks. W: M. Kinney. Concrete Cem 6:158-9 Mr '15
Oil-proof reservoirs of concrete. W: M. Kinney. Concrete Cem 6:251-2 My '15

Reinforced-concrete tank of 100,000-gallon capacity designed by use of diagrams. A. R. James. diags Eng Rec 72:135-6 Jl 31 '15 See also Water towers, Concrete

Tanks, Sewage. See Imhoff tanks; Septic tanks; Sewage tanks

Tanks, Steel

Galvanized corrugated steel tanks in Australia. H. W. Mitton. Metal Work 83:702 My

Moving large steel grain tanks, il Sci Am 113: 185 Ag 28 '15

Rebuilding a burned oil tank, C. P. Bowie, il Eng N 74:976-7 N 18 '15

Contributions of the chemist to the leather industry. W: H. Teas. J Ind & Eng Chem 7: 283 Ap '15 283 Ap

Tannins

Tannin content of Pacific coast conifers, H. K. Benson and T: G. Thompson, il J Ind & Eng Chem 7:915-16 N '15

Tantalum

Atomic weight of tantalum. G: W. Sears and C. W. Balke. diags Am Chem Soc J 37:833-44 Ap '15

Tapalog

Tapalog, a new multiple record pyrometer re-corder. il Met & Chem Eng 13:260-1 Ap '15; Iron Age 95:609 Mr 18 '15; Elec W 65:871 Ap 3 '15; Power 41:541 Ap 20 '15

Tape, Insulating. See Insulating tape

Tape, Steel. See Steel tape

Tapping machines

angelier semi-automatic multiple tapping machine. il Mach 21:425-6 Ja '15

National automatic nut tapper, il Mach 21: 515-17 F '15; Iron Age 95:240 Ja 28 '15; Iron Tr R 56:268-9 F 4 '15; Ind Eng 15:11-12 Ja

New principle in nut tapping machinery. diag Ry R 56:812-13 Je 12 '15

Tapping and countersinking machine. il Iron Age 96:515 S 2 '15

Taps
A. S. M. E. tap limits. Mach 21:474-5 F '15
Collapsible tap of new design, by the modern
tool co. il diags Iron Tr R 57:692-3 O 7 '15;
Ry Age (Mech ed) 89:544-5 O '15

Collapsing adjustable shrapnel tap. il Iron Age 96:745 S 30 '15

Collapsing tap for shell work, diag Iron Tr R 57:447 S 2 '15

Tap and screw limits. diags Mach 22:54-7 S

Victor shrapnel shell tap. il diag Mach 22:70

Centrifugal dehydration of water gas tar at Amsterdam. Am Gas Light J 102:349 My 31 '15

Development of refined tars for use in

Development of refined tars for use in road construction and maintenance. P. P. Sharples. Met & Chem Eng 13:918-20 D 1 '15 Electrical process for detarring gas. F. W. Steere. il diag Met & Chem Eng 12:775-8 D '14; Same. Am Gas Inst Pro 9:pt 1, 178-89 '14; Same cond. Eng N 72:1007 N 19 '14; Same cond. Eng M 8:736-9 F '15; Discussion. Am Gas Inst Pro 9:pt 1, 189-99 '14 Oil tar separation, recovery and disposal. R. E. Wyant. Am Gas Inst Pro 9:pt 1, 313-19; Discussion. 319-39 '14

Physical constants of gas oils and derived tars, W. F. Rittman and G. Egloff, J Ind & Eng Chem 7:481-4 Je '15

Specific gravity—its determination for tars, oils and pitches. J: M. Weiss. il J Ind & Eng Chem 7:21-4 Ja '15

Tar paint proves better than lead paint on pipes. B. Dibble. Eng Rec 72:349-50 S 18 '15; Same. Eng N 74:973-4 N 18 '15; Same cond. Eng & Contr 44:181 S 8 '15

See also Coal tar; Gas manufacture and works; Roads, Tarred

Tar as fuel

Heating an open-hearth furnace by tar. A.

Greiner. Iron Age 95:1072-3 My 13 '15; Same.
Engineer 119:495 My 14 '15; Same. Iron Tr R
56:1017-18 My 20 '15; Abstract. Met & Chem
Eng 13:445 Jl '15

Target practice
Target practice in our navy. Sci Am 113:58
Jl 17 '15

See also Rifle ranges

Anti-dumping legislation in Canada, South Africa, and Australia. Textile World 50:176-9 N '15

Tariff ariff and the ultimate consumer. Emery, Textile World 50:179-83 N '15

See also Drawbacks

Canada

Canada's new tariff. Iron Age 95:538 Mr 4 '15 Working of Canada's anti-dumping law. Iron Age 96:758-9 S 30 '15

India

British India. U S Sp Cons Rep 72:135-7 '15

United States

Component material of chief value. il Textile World 50:51-4 O '15

Home market club annual meeting, Nov. 18, 1914. Textile World 48:302-4 D '14

Lest we forget! Who killed Cock Robin? The U. S. tariff-history of coal-tar dyes. B. C. Hesse. J Ind & Eng Chem 7:694-709 Ag '15; Excerpts. Textile World 49:593-6 S '15 Letters of Messrs, Tripp and Matthews on business conditions. W. F. Hickernell. Elec W 65:972-3 Ap 17 '15 Necessity of tariff reform for the American chemical industries. H. H. Gross. Met & Chem Eng 13:676 O 1 '15

Who killed Cock Robin? notes on the tariff history of coal-tar dyes, Sci Am S 80:135 history of Ag 28 '15

See also Cotton tariff

Tarred roads, See Roads, Tarred

Tartaric acid

Manufacture of cream tartar, O: Best. Met & Chem Eng 13:613-17 S 15 '15

Task system ask system
Results of task work without bonus in cleaning
filter sand at Philadelphia. S. E. Thompson.
Eng Rec 70:608-9 D 5 '14; Same. Eng &
Contr 42:579-81 D 23 '14; Same cond.; with
discussion. Am Soc M E J 37:102-4 F '15;
Same cond. (Efficiency study of filter cleaning). Munic J 38:253-4 F 25 '15

Task setting, C. J. Morrison, Eng M 49:894-900 S'15

See also Bonus system

Taxation

New York tax list: fluctuation of real estate values due to lack of regulation of the character of buildings. Am Inst Arch J 2:572-

J 99:874 My 15 '15 Taxes in Colombia.

See also Electric railroads—Taxation; Income tax; Mine taxation; Municipal finance; Public service corporations—Taxation; Tariff

Taxicabs, Electric Electric taxicabs.

Electric taxicabs, A. J. Marshall. Elec R & W Elec'n 66:695-6 Ap 10 '15
Electric taxicabs in Detroit reduce operating costs 40 per cent. il Elec R & W Elec'n 67: 871-2 N 6 '15
Why electric taxicabs should succeed, I. S. Scrimger, Automobile 33:760-1 O 21 '15

Taylor, Frederick Winslow, 1856-1915
Father of scientific management and co-inventor of high-speed steel. por Iron Age 95: 676-8 Mr 25 '15

Great engineer passes away, por Iron Tr R 56: 604-6 Mr 25 '15

Memorial meeting of the Society to promote the science of management. Iron Age 96: 1029-30 O 28 '15

Memorial meeting of the Society to promote the science of management. Iron Tr R 57: 827 O 28 '15 Sketch, H: R. Towne, por Eng M 49:160-3 My

Tea rooms and tea houses
Assembly tea rooms, Boston; views. Arch Rec
37:83-7 Ja '15

Teachers, Training of

Training of shop teachers for industrial schools.

H. E. Speece. Mach 22:47-8 S '15

Teak wood

Mechanical properties of teak wood; abstract, A. Weiskopf. Am Soc M E J 37:289-90 My '15 Technical commissioners. See Consular service

Technical education

New ideas in mechanical education. Mach 22:164-5 O '15

Technical training in India. Engineer 120:429-30 N 5 '15

Training for the industrial side of engineering. A. P. M. Fleming. Inst E E J 53:570-3; Discussion. 53:574-86 Ap 15 '15

Apprentices; Correspondence alsoSee also Apprentices; Correspondence schools and courses; Engineering education; Foundry practice—Study and teaching; Industrial education; Mining schools and education; Professional education; Railroad education; Schools and shops, Cooperation of; Trade schools; Vocational education; also Throop college of technology

Technical journals. See Engineering periodicals

Technical literature, Joint committee on classification of. See Joint committee on classification of technical literature

Technical writing

Bettering the use of English, S: C. Earle, Elec Ry J 45:94 Ja 9 '15

Faults of technical literature, R. Fleming, Eng N 74:548-9 S 16 '15

Writing technical articles. H. T. Owens. Am Gas Light J 102:1-2 Ja 4 '15

Technology
Philosophy and technics, G. Bugge, Sci Am
S 79:124 F 20 '15

8 79:124 F 20 15

See also Building; Chemistry, Technical;
Classification; Electric engineering; Engineering; Industrial education; Machinery;
Metallurgy; Photography; Railroad engineering; Technical education; also names of specific industries, trades, etc., e. g.
Paper making, Printing

Teeth

Recognizing vocations from the teeth. il Sci Am S 79:300 My 8 '15

Telautograph

Facsimile telegraphy and phototelegraphy. Sci Am 112:571+ Je 5 '15

Telegraph

Censorship of railway messages. W. W. Hall. Ry Age 58:1479 Je 25 '15

Census of telephone and telegraph systems. Elec W 65:625-6 Mr 6 '15
Census report on telephones and telegraphs. Elec R & W Elec'n 66:444-5 Mr 6 '15
Communicating over great distances; the invention of the telegraph, telephone and wireless telegraphy. il Sci Am 112:531-2 Je 5

Tib Future progress of cable telegraphy; abstract. H. W. Malcolm. Elec W 65:1685 Je 26 '15 Railway telegraph superintendents annual convention. Ry Age 59:19-20 Jl 2 '15 Telegraph relays: abstract. H. W. Malcolm. diags Elec W 65:403-4 F 13 '15 Year in the electrical industry. Elec R & W Elec'n 66:5-6 Ja 2 '15

See also Cables, Submarine; Electric wire and wiring; Military telegraph; Poles; Train dispatching; Wireless telegraph

## Picture transmission

See, Phototelegraphy

Telegraph, Military. See Military telegraph

Telegraph, Printing

High speed and printing telegraphs. il Sci Am 112:532 Je 5 '15 High-speed printing telegraph system. C. Kinsley. il Am Inst E E Pro 33:1071-81 Je '14; Same cond. Sci Am S 80:84-5 Ag 7 '15; Discussion. Am Inst E E Pro 33:1898-1905 D 14

New printing telegraph system developed for the Western union company using the typethe Western union company using the type-writer-printing principle. P. M. Rainey. il diags Elec W 65:848-57 Ap 3 '15 Printing telegraph. il Sci Am S 80:252-3 O 16

System of long distance typewriting; eight messages sent simultaneously over a single wire. il Sci Am 112:438+ My 8'15 Western Union multiplex printing telegraph, D. Murray. Elec W 65:1284-5 My 22'15

Telegraph, Submarine. See Cables, Submarine Telegraph, Wireless. See Wireless telegraph Telegraph poles. See Poles

Telemeter, Stereoscopic, See Stereoscopic telemeter

Telephone

elephone
Audion telephone repeater, F. M. Williamson.
Elec W 65:900 Ap 10 '15
Automatic switchboard telephone system of
Los Angeles, Cal. W. L. Campbell. il Am
Inst E E Pro 34:1847-71 Ag '15
Automatic telephone system at the Kansas
City terminal. il Ry R 55:768-70 D 26 '14
Census of telephone and telegraph systems.
Elec W 65:625-6 Mr 6 '15
Census report on telephones and telegraphs.
Elec R & W Elec'n 66:444-5 Mr 6 '15
Chest telephone for aeroplane pilots. il Sci
Am 113:255 S 18 '15; Elec R & W Elec'n 67:
211-12 Jl 31 '15
Communicating over great distances; the in-

211-12 J1 31 '15 Communicating over great distances; the invention of the telegraph, telephone and wire-less telegraphy. il Sci Am 112:532+ Je 5 '15 Compact service board in Boston telephone building. il Elec W 65:1251-2 My 15 '15 Cordless vestibule telephone. il Elec W 66:421 Ag 21 '15

Ag 21 '15
Development of the national telephone system.
M. C. Rorty. Am Soc M E J 37:709-10 D '15
Electrical equipment for enabling the deaf to hear i Elec W 66:1221-2 N 27 '15
Explorations over the vibrating surfaces of telephonic diaphragms under simple impressed tones. A. E. Kennelly and H. O. Taylor. Elec W 66:463 Ag 28 '15
How Bell invented the telephone. T: A. Watson. Am Inst E E Pro 34:1503-13 Ag '15
Operating features of the audion: explanation of its action as an amplifier, as a detector of high-frequency oscillations and as a valve. E. H. Armstrong. diags Elec W 64:1149-52 D 12 '14
Railroad tracks as conductors for telephonic

Railroad tracks as conductors for telephonic communication. il Sci Am 113:363+ O 23 '15 Recent telephone patents. diag Elec W 65:993, 1120 Ap 17, My 1 '15

Relative cost of manual and automatic tele-phony. Elec R & W Elec'n 66:300 F 13 '15

Telephone dispatching at San Antonio, il Elec Ry J 46:92-3 Jl 17 '15

Telephone -- Continued

Telephone dispatching in city service. E. E. Strong. il Elec Ry J 45:885-7 My 8 '15
Telephone dispatching on street-railway lines. il Elec R & W Elec'n 65:1150-1 D 12 '14
Telephone equipment for churches. il Elec R & W Elec'n 67:488-9 S 11 '15; Elec W 66:711 S 25 '15

25 '15 Telephone switch. J. D. Lewis, diags Elec R & W Elec'n 66:549 Mr 20 '15 Telephone that tells who called while you were out. if Elec W 66:18 JI 3 '15 Telephone train dispatching on the Cedar Rapids & Iowa City railway, if Elec Ry J 44:1309 D 12 '14

44:1309 D 12 '14
Telephone troubles in the tropics. W. L. Preece.
diags Inst E E J 53:545-51 Ap 15 '15; Abstracts. Elec R & W Elec'n 66:738-9 Ap 17
'15; Eng M 49:424-5 Je '15; Sci Am S 79:355
Je 5 '15; Discussion. Inst E E J 53:551-65
Ap 15 '15

Ap 15 '15
Telephones for use in mine rescue work demonstrated at San Francisco. il Elec R & W Elec'n 66:830 My 1 '15
Telephony and telegraphy session of Am. Inst. E. E. Elec R & W Elec'n 67:570-2 S 25 '15
Thermal telephone: abstract. M. de Lange. il Elec W 65:96 Ja 9 '15
Thermaphone. Sci Am 113:87 Jl 24 '15
Toll telephone traffic: an experimental study of the relationship between circuit loads and delay to traffic. F. F. Fowle. Am Inst E E Pro 33:1063-70 Je '14; Discussion. 33:1896-7

Year in the electrical industry. Elec R & W Elec'n 66:5-6 Ja 2 '15

See also Electric wire and wiring; Telephone lines; Wireless telephone

### Extension systems

Industrial plant to install extensive private telephone system. il Elec R & W Elec'n 65:1192-3 D 19 '14
Locating an executive in the factory. H. A. Russell. plan Iron Age 95:344-5 F 11 '15

# Intercommunicating systems

Couch autophone system. il Eng M 49:sup3-4 S

Intercommunicating telephone systems, T. L. Lee. Elec R & W Elec'n 66:859-61 My 8 '15

Columbia, Mo., telephone company. Elec R & W Elec'n 66:955-6 My 22 '15

New York telephone rate revision. Eng N 73: 691, 697 Ap 8 '15

Telephone, Military. See Military telephone

Telephone association, National independent. See National independent telephone association

Telephone booths
Ventilation of telephone and movie booths.
R. L. Douglass. Dom Eng 69:161-2 N 7 '14'
Same; with discussion. Am Soc Heat & V
E 20:330-6 '14

Telephone cables

London-Birmingham-Liverpool telephone ca-ble, diags Engineer 120:277 S 17 '15

Telephone companies

American telephone annual report. Elec W 65: 753-4 Mr 20 '15
Annual report of the American telephone and telegraph company for the year ended December 31, 1914. Elec R & W Elec'n 66:532-3 Mr 20 '15
Ettrick telephone company; rates to stockholders. Elec R & W Elec'n 67:66-7 Jl 10 '15

National independent telephone association annual convention, Chicago, February 3 to 5. Elec R & W Elec'n 66:305-8 F 13 '15

### Accounting

Interstate commerce commission's uniform system of accounts for class C telephone companies—objections as set forth in the brief submitted by the Wisconsin railroad commission. J Account 19:398-401 My '15

Telephone in war. See Military telephone

Telephone lines

Across the continent by telephone. il

Elec R & W Elec'n 66:210-15 Ja 30 '15

Across the continent by telephone, il Sci Am 112:129 F 6 '15; Same cond. Eng M 48:908-9 Mr '15

Mr '15
Aerial telephone-cable terminal, il Elec R & W Elec'n 67:686 O 9 '15
High voltage arrester for telephone lines, E. P. Peck, il Gen Elec R 18:189-94 Mr '15
Inauguration of transcontinental telephony, diag map Elec W 65:279-80 Ja 30 '15
Protecting linemen when using telephone circuits paralleling transmission lines, il Elec W 66:812 O 9 '15

W 66:N2 O 9 '15
Pupin coils for telephone lines; abstract. F.
Breisig. Elec W 66:600 S 11 '15
Submarine cable rapid telegraphy; ocean and intercontinental telephony. B. Gati. il diags
Am Inst E E Pro 34:2101-29 S '15
Trigonometric expressions for the phenomena occurring in long transmission lines. V.
Karapetoff. Elec W 66:914-15 O 23 '15

See also Telephone cables

Telephone poles, See Poles

Telephone receiver connected to calipers. A. J. Carr. diags Power 41:621 My 4 '15

Telephotography

Air transparency for infra-red rays: applica-tion of these rays to telephotography. G. Michaud and J. F. Tristan. il Sci Am 111:521 '14

See also Phototelegraphy

Telescope sights

Telescope sights for fighting rifles. E: C. Cross-man. il Sci Am 113:118-19 Ag 7 '15

Telescopes

Measurement of distances in war. A. Keller, il diags Sci Am S 79:324-5 My 22 '15 Power of telescopes. W. E. Woolard. Sci Am S 80:46 Jl 17 '15

See also Periscope

Telpherage

Elpetrical appliances for workshops. il diag Engineer 120:40-1 Jl 9 '15 Telpher furnace charging. N. Kapp. diags Iron Age 94:1388-9 D 17 '14 Telphers expedite coal movement at German plant. A. Gradenwitz. il Eng Rec 71:615 My 15 '15

See also Cableways; Conveying machinery

Temperament

Antecedents of the study of character and temperament. J. Jastrow. Sci Am S 80:191-2 S 18 '15

odern psychology; the present study of character and temperament. J. Jastrow. Sci Am S 80:306-7 N 13 '15 Modern

Temperance

Intoxication, a cause of accidents. T: D. West. il Iron Tr R 56:713-16 Ap 8 '15; Same. Foun-dry 43:267-70 Jl '15

Temperature

effect of moisture in the earth on temperature of underground cables. L. E. Imlay. diags Am Inst E E Pro 34:263-70 F '15; Discussion. 34:2615-19 N '15

See also Boiling points: Earth temperature; Freezing points; Melting points

## Measurement

Measurement

Conversion scale for centigrade and fahrenheit temperatures. H. P. Tiemann. Am Inst. Min F. Bul 102:1247-8 Je '15: Same Iron Age 96:31 Jl 1 '15; Discussion. Am Inst Min E Bul 108:2512-13 l) '15

Course in high temperature measurements at Purdue university. E. S. Ferry. il Met & Chem Eng 13:454-5 Jl '15

Determination of critical points in iron, steel and alloys. il diags Met & Chem Eng 13:643-4 S 15 '15

Limits of experimental investigation. Sci.

4 S 15 '15 Limits of experimental investigation. Sci Am S 80:83 Ag 7 '15

80:83 Ag 7 '15 Measurement of rapidly changing tempera-tures; abstract. A. Petersen. Met & Chem Eng 13:189 Mr '15

Measuring atmospheric comfort. il Sci Am 112: 431 My 8 '15

otentiometers for thermoelectric measure-ments especially in calorimetry. W. P. White, diags Am Chem Soc J 36:1868-85 S Potentiometers

Temperature—Measurement—Continucd
Temperature changes in mass concrete found
to be relatively small. Eng Rec 71:710 Je 5

The Temperature measurements in concrete buildings. Concrete Cem 6:155-7 Mr '15
Temperature of the mercury arc. J. C. McLennan. Sci Am S 79:107 F 13 '15
Thermoelement installations, especially for calorimetry. W. P. White, diags Am Chem Soc J 36:1856-68 S '11

See also Freezing points; Pyrometers and yrometry; Thermometers; Thermophones; Thermopiles

Temperature, Atmospheric. See Atmospheric temperature

Temperature, High

emperature, High Classification of high-temperature physical problems. E. F. Northrup. Met & Chem Eng 13:147-50 Mr '15
Course in high temperature measurements at Purdue university. E. S. Ferry. il Met & Chem Eng 13:454-5 Jl '15
Estimation of high temperatures by the method of color identity. Met & Chem Eng 13:444 Jl '15

J1 '15
High temperature investigation and a study of metallic conduction. E. F. Northrup. J Fr Inst 179:621-62 Je '15; Abstract. Elec W 65: 1614-15 Je 19 '15
Producing the effective temperature of the sun. Sci Am 112:328+ Ap 3 '15
Properties of metals at higher temperatures; abstract. P. Ludwik. Am Soc M E J 37:604-5

()

Temperature, Low

emperature, Low
Absolute zero. S. Dushman. diags Gen Elec R
18:93-100, 238-48 F, Ap '15
Behavior of enzymes at low temperatures.
J. S: Hepburn. J Fr Inst 179:581-5 My '15
Electrical resistance as effected by very low
temperatures. Sibley J 29:106-7 Ja '15; Same.
Sci Am S 79:82 F 6 '15
Kammerlingh Onnes, the Dutch specialist in
cold. por Sci Am 112:151+ F 13 '15
Thermometry of low temperatures. Sci Am
113:265 S 25 '15
emperature recorders

Temperature recorders

Multiple-type recording instrument for pyrometers. il Met & Chem Eng 13:643 S 15 '15 Recording instruments for heat-treating, il Automobile 32:460-1 Mr 11 '15 Tapalog, a new multiple record pyrometer recorder, il Met & Chem Eng 13:260-1 Ap '15; Iron Age 95:609 Mr 18 '15; Elec W 65:871 Ap 3 '15; Power 41:541 Ap 20 '15

Temperature regulators. See Thermostats

Temples

Mysterious Baalbek, Mrs. T: E. LePage, il Sci Am S 78:407-10 D 26 '14

Templets

Cardboard templets for laying out structural work. Eng N 74:461-2 S 2 '15 Rail templet for use in valuation inventory, F. V. Purcell. diag Ry Age 59:960 N 19 '15

Templet for curve-worn rail, diag Ry Age 59: 970 N 19'15

Tenants. See Landlord and tenant

Tenders, Locomotive. See Locomotive tenders

Tenders, Naval

Auxiliary naval vessels; classification of naval vessels—description of the destroyer tender Melville. il Int Marine Eng 20:295-7 Jl '15

Tenement houses

Sanitary engineer's views on housing. T: J. Claffy, il Dom Eng 73:45-6 O 9 '15

See also Housing problem

Tennessee

See also Geology-Tennessee

Tennessee master plumbers' association 15th annual convention, Nashville, March 22. Dom Eng 70:413-14 Mr 27 '15

Tennis

Science as an aid to practical tennis, D. Doug-lass, Sci Am 113:430+ N 13 '15

Tennis as compared to golf. D. Douglass. Sci Am 113:383 O 30 '15

Throwing vs. batting a tennis ball. D. Doug-lass. il Sci Am 113:254 S 18 '15

Terhium

Chemical research on terbium. C. James and D. W. Bissel. Am Chem Soc J 36:2060-6 O

Terminal companies
Federal valuation of joint facilities. R: J.
McCarty. Ry Age 58:699 Mr 26 '15

Terminals

Cotton warehouse and terminal at New Or-leans, diag Eng N 73:1217 Je 24 '15 Design and construction features of the Ocean

leans. diag Eng N 73:1217 Je 24 '15
Design and construction features of the Ocean
steamship co.'s terminal at Savannah, Ga.
il paans Eng & Contr 41:313-4 N 3 '1.5
Export coal terminal of the Southern railway
at Charleston, S. C. il Ry R 57:620-1 N 13 '15
Handling of freight in terminals R. H. Rogers.
Am Inst E E Pro 34:3048-52 D '15
Hunt's Point terminal in New York involves
difficult bulkhead construction. il diags map
Eng Rec 72:104-6 Jl 24 '15
Marine terminal machinery. H. Sawyer. Int
Marine Eng 20:109-11 Mr '15
New deep water pier at Halifax, Nova Scotia.
A. F. Dyer. il Concrete Cem 7:7-13 Jl '15;
Same cond. Eng N 73:1204-10 Je 24 '15
New marine terminals at Beaumont, Texas;
abstracts. H. M. Harding, il plan Eng N 73:
1072-3 Je 3 '15; Eng & Contr 43:supp28 My
19 '15; Eng Rec 71:121 Je 5 '15; Int Marine
Eng 20:299-300 Jl '15; Ry R 57:679-81 N 27
'15

New York freight terminals, 1914. Ry Age 59: 395-7 Ag 27 '15
Newark is rapidly creating its own water terminal in New Jersey meadows. il diags plan Eng Rec 72:201-3 Ag 14 '15
Novel bulkhead for wharves at Jacksonville. H. D. Mendenhall. diags map Eng N 74:772-4 O 21 '15

4 O 21 '15
Points of attack in the terminal problem, J. A. Jackson, il Int Marine Eng 20:111-13 Mr '15
Possibilities open to the central station in solving the freight terminal problem, J. A. Jackson, Gen Elec R 18:1142-4 D '15
River terminal at East St. Louis, Ill. diags. Eng N 74:543 S 16 '15
Santa Fe to solve Chicago fruit terminal problem, plan Eng Rec 71:819-20 Je 26 '15
Steamship terminal in the Bronx, il diag maps. Sci Am 112:80-1 Ja 23 '15
Terminals the need of inland water transports

Terminals the need of inland water transportation; New Orleans report. Eng Rec 72:565-6 N 6 '15

Transfer facilities at marine terminals. H. M. Harding. il Int Marine Eng 20:98-102 Mr '15 Water terminals on the Mississippi river. Eng N 73:507 Mr 11 '15

Ste also Docks; Freight handling; Locomotive terminals; Ports; Railroads—Terminals; Street railroads—Terminals

Terminals, Railroad. See Railroads-Terminals Terminology. See Electric wire and wiring— Terminology; Road materials—Terminology; Science—Terminology

Ternary mixtures

Partial vapor pressures of tenary mixtures of toluene, carbon tetrachloride and ethylene bromide. M. A. Rosanoff, J: F. W. Schulze, and R. A. Dunphy. Am Chem Soc J 36:2480-95 D '14

Terra cotta

Suggestions for laying terra cotta. Bldg Age 37:33 F '15

Terraces

Mappin terraces at the Zoo. R. N. Stroyer, il diags Engineer 119:156-7 F 12 '15

Tesla, Nikola, 1857-Nikola Tesla's fountain. il Sci Am 112:162 F 13 '15

Personal recollections. por Sci Am 112:537+ Je 5 '15

Test roads. See Roads, Experimental

Testing

American society for testing materials annual meeting, June 22-26; abstracts of papers and discussions. Eng N 74:36-41, 67-9 Jl 1-8 '15.

American society for testing materials 18th annual meeting. Power 42:33-6 Jl 6 '15

Fixing the elastic limit standard, T. D. Lynch, il Iron Tr R 57:79-81+ Jl 8 '15

Testing -Continued

esting—Continued
Noten shock tests and the law of similarity;
abstract. R. Stribeck, diag Am Soc M E J
37:183-4 Mr '15
Pennsylvania railroad test department. C. D.
Young. il plan Ry Age (Mech ed) 89:332-7
Jl '15; Same. Ry Age 59:6-11 Jl 2 '15; Same.
Ry R 57:2-5, 42-6, 117-18 Jl 3-10, 24 '15

Ry R 57:2-5, 42-5, 117-18 J1 3-10, 24 15
See also Electric testing; Freezing tests;
Laboratories; Strength of materials; Testing machines; also subject tested, e. g. Boilers—Testing, Cement testing, Coal testing,
Concrete—Testing, Gas and oil engines—
Testing, Gas testing, Steam engines—Testing, Steel—Testing, Steel—Testing; also American society for testing materials

Testing, Electric. See Electric testing

Testing machines
British Fortland cement making machinery.
il diags Engineer 120:173-6 Ag 20 '15
Cause of brittleness in soft steel: German
tests on a Krupp shock-testing machine.
Iron Age 94:1322-3 D 3 '14
Charpy impact test on treated steels. J. J.
Thomas. il Iron Age 96:138-40 Jl 15 '15
Colburn twist drill testing machine. il Mach
22:251-2 N '15
Cylinder friction and lubrication testing
apparatus. A. Flowers. diag Power 42:208-

ylinder friction and lubrication testing apparatus. A. Flowers. diag Power 42:208-10 Ag 10 '15

10 Ag 10 '15 Dynamic properties of cast steel. J. L. Uhler, il Iron Tr R 57:630-2 S 30 '15; Same. Iron Age 96:754-6 S 30 '15; Same. Foundry 43:447-

Field testing machine used on Welland ship canal, il diags Eng Rec 72:112 Jl 24 '15 Fifty-ton testing machine built in college shop. C. C. Myers, il diag Eng N 74:1050-1 N 25 '15

N 25 '15 '15 Flotation testing machine, R. W. Smith, diags Eng & Min J 100:395-6 S 4 '15 Hydraulic hardness testing machine, il Met & Chem Eng 13:646 S 15 '15 Hydraulic testing machine, il Iron Tr R 56: 519 Mr 11 '15 Kick vs. Rittinger: an experimental investigation in rock crushing, performed at Purdue university. A. O. Gates, il diags Am Inst Min E Bul 105:2023-51 S '15 Laps and lapping. W. A. Knight and A. A. Case, diags Am Soc M E J 37:451-6 Ag '15; Same cond. Iron Tr R 57:24-6 Jl 1 '15; Discussion. Am Soc M E J 37:456-8 Ag '15 'Slotor driven Universal tester for fabrics, il Textile World 50:123 O '15 New rope-testing machine, il diag Eng N 74:

New rope-testing machine, il diag Eng N 74: \_ 172-3 Jl 22 '15

172-3 Jl 22 '15
Pneumatic drop machine for the foundry. G. S.
Evans. il Iron Age 96:674-5 S 23 '15
Results obtained with ground hobs. E: K.
Hammond. il diag Mach 21:695-700 My '15
Smoothness-testing machine for pavements. il
Eng N 74:751-2 O 14 '15
Testing surveyors' tapes by the Canadian government. J. A. Macdonald. il Eng N 74:41415 Ag 26 '15
Testing the consistency of asphalt. il Sci Am
113:236. S 11 '15

Testing the consistency of asphalt, il Sci Am 113:2364 S 11 '15

Testing the hardness of iron castings, G. S. Evans, il diag Iron Age 96:8-10 J1 '15

Tool for hardness tests developed by L. Loewe & co. H. Friedmann, il Iron Tr R 57:899 N 4 '15

Universal strainometer of simple design, S. H. Graf. il Iron Age 96:134-5 J1 15 '15
Von Kapff's oil testing machine; abstract. Am
Soc M E J 37:412-13 J1 '15
Walker wedge testing machine, il Iron Tr R
57:438 S 2 '15

Watch spring testing apparatus, il Sci Am 111: 494 D 12 '14 494 D 12

Tetanus

Tetanus serum for the French army. Sci Am S 80:5 Jl 3 '15

Vaccine virus not the cause of tetanus. Sci Am S 80:155 S 4 '15

Texas

See also Roads-Texas

## Industries and resources

Investigation of sources of potash in Texas. W: B. Phillips. il Am Inst Min E Bul 98: 115-27 F '15

Petroleum in Texas and Louisiana, A. J. Haz-lett. Eng & Min J 99:137-9 Ja 16 '15

Textile association, Southern. See Southern textile association

Textile design

extile design
Designs for a basket weave. il Textile World
49:537 Ag '15
Hand book of weaves. G. H. Oelsner. il Textile World 46:408-11, 503-6, 586-9; 47:87-9,
280-2, 317-9, 408-12, 504-7, 594-9; 48:122-7,
208-12, 316-21, 400-3, 496-501, 589-93; 49:
87-91, 163-7, 337-42 Ja '14-Je '15

See also Design, Decorative

Textile fibers

Fibers not generally known. R. Dantzer. Tex-file World 48:404-5 Ja '15 Germans find substitute for jute and hemp. H. G. Seltzer. Textile World 49:642 S '15 Preparing flax or hemp for spinning. Textile World 49:127-8 Ap '15

See also Cotton; Flax; Hemp; Silk; Wool

Textile finishing
Manufacture of elastic fabrics, S: Brown. il diags Textile World 48:394-7 Ja '15
Prein finishing process for textiles. Textile World 48:426 Ja '15
Process for treating open-mesh fabrics. Textile World 49:641-2 S '15
Process for treating yarn and twine. diag Textile World 49:460-1 J1 '15

See also Wool finishing

Textile industry and fabrics

British India; textile manufactures. U S Sp
Cons Rep 72:235-58 '15
Contributions of the chemist to the textile
industry. F. W. Hobbs, J Ind & Eng Chem 7:
280-1 Ap '15
European textile industry. Textile World 49:

Large and textile industry. Textile World 49: 405-8 Jl '15
French army contracts modified for the benefit of Americans. Textile World 49:321-2 Je

Measuring of textile fabrics. E. H. Marble. Textile World 49:85-7 Ap '15 Our textile industries and Europe's calamity. A. H. Gulliver. Textile World 49:223-4 My

Secretary Redfield and the textile industry. Textile World 48:286a-286c D '14 Situation in Germany. Textile World 48:564-7

Tariff and the ultimate consumer, I ery. Textile World 50:179-83 N '15

Textile industries of Great Britain and Germany. J. A. Hunter. Textile World 48:597-600; 49:328-31 Mr, Je '15

Textile trade in Germany. Textile World 48: 376-8 Ja '15

War and our chemical industries. W. D. Livermore, J Ind & Eng Chem 7:61 Ja '15
Woven fabric for fire hose, il Textile World 49:425-6 Jl '15

49:425-6 Jl '16

See also Bleaching; Cotton; Cotton fabrics; Drying apparatus (for textile fabrics); Dyes and dyeing; Elastic fabrics; Fulling; Gas mantles; Haircloth; Hosiery; Knit goods; Lace; Shoe cloth; Silk; Spinning; Textile design; Textile fibers; Textile finishing; Textile machinery; Textile mills; Textile printing; Underwear; Weaving; Wool; Woolen and worsted manufacture; Worsted; Varn Yarn

Cloth inspection

Inspection of white cloth, Textile World 49: 98-9 Ap '15

Cloth testing

Testing cloth for its wearing qualities. Textile World 49:660-1 S '15
Testing the resistance to wear of cloth. Textile World 48:430-1 Ja '15

## Exhibitions

Southern textile exposition, Greenville, S. C., Nov. 2-6; with list of exhibitors. Textile World 50:65-6, 166-76 O-N '15

Pure fabric legislation. K. B. Lamb. Textile World 50:152-3 N '15

Textile industry and fabrics—Law—Continued
Pure fabrics, H. B. Cheney, Textile World
50:192-5 N '15
Smith pure textile bill, Textile World 49:63-4
Ap '15

Studying the textile labeling bills. Textile World 48:371 Ja '15

## Tables, calculations, etc.

Straight line textile calculations. S: S. Dale.
Textile World 49:427-33, 514-18, 650-6; 50:8994, 204-10 Jl-N '15
Textile analysis and fabric value determination for cotton back satin. W: J. Schepp.
Textile World 50:78-9 O '15

### Testing

Quick method for testing the non-staining quality of textile oils. T: T. Gray. il Textile World 49:568-9 Ag '15
Testing and properties of textile materials. il diags U S Bur Stand Circ 41:1-26 '15
Testing textile materials. Textile World 48: 556-7 Mr. '15

diags Testing tex

Tests for tire fabrics. il Textile World 49:562-4 Ag '15

Textile law. See Textile industry and fabrics-Law

Law
Textile machinery
Automatic cloth feed for tentering machines.
il diag Textile World 49:374-5 Je '15
Cameron principle of cutting fabrics. il Textile
World 49:605-6 S '15
Cameron process for slitting and winding
strips for surgeons' bandages and other purposes. il Textile World 48:346-50 D '14
Cloth shearing machine. diags Textile World
50:117-18 O '15

50:117-18 O '15
Device for laying cloth, diags Textile World 49:113 Ap '15
Finishing of belting fabrics, diag Textile World 49:684-5 S '15
Fulling and washing mill for knit goods, il Textile World 50:124-5 O '15
Haubold improved press for underwear and hosiery, il Textile World 49:451-2 Jl '15
Improved high pressure boiling jigger, il diag Textile World 48:427-8 Ja '15
Machine for finishing fabrics, diags Textile World 49:463-5 Jl '15
Machines for preparing absorbent cotton, il Textile World 48:350-1 D '14
New flat seaming machine for knitted goods, il Textile World 48:513-15 F '15
New Lancashire cloth winder, il Textile World 48:439-42 Ja '15

Steaming and drying machine for textiles. diags Textile World 49:116-17 Ap '15 See also Carding machinery; Cotton ma-chinery; Dyeing machines; Knitting machin-ery; Looms; Silk machinery; Sponging and shrinking machine; Spoolers

Textile mills

Electric power in the textile industry. C. A. Chase. il Gen Elec R 18:540-50 Je '15

Electricity in textile mills, il Elec R & W Elec'n 67:789-91 O 30 '15

Northern man in the South. Textile World 49: 73-4, 313-15 Ap, Je '15

Passementerie mill. plans Textile World 48: 445-7 Ja '15

Problem of mill lighting. Textile World 50:81-5 0

Report of mill construction for 1914. Textile World 48:287-301 D '14

Static electricity in a textile mill, W: T. Estlick, diag Elec R & W Elec'n 67:231 Ag 7 '15 See also Cotton mills; Knitting mills: Looms

Textile printing

Printing process for wool goods. Textile World 48:385-6 Ja '15

Textile schools

Are the textile schools doing all that should be expected of them? A. N. Sheldon, Tex-tile World 49:624-6 S '15

List of the textile schools in the United States. Textile World 49:535 Ag '15

Textile testing. See Textile industry and fabrics—Testing

Thallium

apor pressure of thallium amalgams. J. H. Hildebrand and E. D. Eastman. Am Chem Soc J 37:2452-9 N '15

Thaumasite

Thaumasite a decomposition of anhydrite. Sci Am 111:509 D 19 '14

Thawing

Electric thawing. Elec R & W Elec'n 66:590-1 Mr 27 '15 Hydrant-thawing apparatus. il diag Munic Eng

49:117-18 S

Pipe thawing, A. C. Kelm, Elec W 65:644-5 Mr 13 '15

13 '15
Pipe-thawing motor truck of the Columbus water-works, il Eng N 73:30 Ja 7 '15
Thawing ground for trenching at Kalamazoo,
A. Lenderink, il Eng N 73:351-2 F 18 '15
Thawing methods at Fairbanks, H. I. Ellis, il diags Eng & Min J 100:1-6 Jl 3 '15

Thayer, Benjamin Bowditch, 1862-Sketch, por Eng M 50:208-9 N '15

Theaters

American theater; its antecedents and charac-teristics, H. Tallant, diags Brickb 23:285-90; 24:17-22 D '14-Ja '15

Keeney theatre, Brooklyn, N. Y.; views. Arch & Bldg 47:140-2 Ap '15 Steel construction for the Schenley theater, Pittsburgh. C. N. Haggart. diags Eng N 73: 658-9 Ap 8 '15

Theatre, from a fire prevention standpoint. E: R. Hardy. Arch & Bldg 46:435-6 N '14 See also Moving picture theaters

Designs and plans

Neighborhood playhouse, Grand street, New York, N. Y. Brickb 24; pl 58-60 Ap '15

Toy theatre, Dartmouth street, Boston. Brickb 24:pl 56-7 Ap '15

Heating and ventilation

Theater cooling, ventilation and I plans Metal Work 83:225-7 F 5 '15 heating. il

Lighting

Lighting of the Finsbury Park Empire, il Illum Engr 8:327 Jl '15

Mobile color and stage lighting. B. Jones. il plan Elec W 66:245-9, 294-7, 346-9, 407-9, 454-6 Jl 31-Ag 28 '15

Therapeutics

Therapeutic uses of preparations of the duct-less glands. R. G. Torrey. Sci Am S 80:122-3, 134-5 Ag 21-28 '15

See also Anesthetics; First aid in illness and injury; Phototherapy; Radiotherapy

Thermal efficiency of the electric furnace. W. M. Johnson. Eng Soc W Pa 31:488-98; Discussion. 31:499-509 Jl '15

New telephone. Sci Am 113:87 Jl 24 '15

Thermit welding. See Welding

**Th**ermochemistry

Entropy of vaporization as a means of distinguishing normal liquids, J. H. Hildebrand. Am Chem Soc J 37:970-8 My '15

Heat of formation of solid solutions. H. W. Foote and B. Saxton. Am Chem Soc J 36: 1704-8 Ag '14

Heat of neutralization of hydroxylamine and tetramethylammonium hydroxide, E. O. El-lingson. Am Chem Soc J 37:699-709 Ap '15

Heat of vaporization of normal liquids. J. Kendall. diag Am Chem Soc J 36:1620-30 Ag '14

Heats of combustion of aromatic hydrocarbons and hexamethylene. T. W. Richards and F: Barry. il Am Chem Soc J 37:993-1020 My '15

Mixed crystals of ammonium chloride with manganese chloride. H. W. Foote and B Saxton. Am Chem Soc J 36:1695-1704 Ag '14

See also Boiling points; Combustion; Dissociation; Melting points; Specific heat; Temperature, High; Temperature, Low; Vapor density

Thermo-couples

Neglected phenomena in steel treatment. M. E.

Leeds. diags Iron Age 96:80-2 Jl 8 '15

Thermo-couples -- Continued

Pyrometers for shop use. J. M. Johnson. diags Mach 21:550-3 Mr '15; Same. Sci Am S 80: 156-8 S 4 '15

Sec also Thermopiles

Thermodynamics

hermodynamics
Determination of pressure variation in steam turbines and of dimensions of nozzles by means of the JS diagram; abstract. Schmolke. Am Soc M E J 37:411-12 J1 '15
Distribution of heat in the cylinder of a gas engine. A. H. Gibson and W. J. Walker. diags Engineer 119:550-1 Je 4 '15; Same cond. Power 41:824-5 Je 15 '15; Abstract. Am Soc M E J 37:417-18 J1 '15
Earth considered as a heat engine. G: F. Becker. Sci Am S 79:391 Je 19 '15
Efficiency of heat engines. R. L. Wales. Power 42:17-18 J1 6 '15
Free energy of some carbon compounds. C. N.

42:17-18 Jl 6 '15

Free energy of some carbon compounds. G. N.
Lewis and M. Randall, Am Chem Soc J 37:
458-70 Mr '15

Heat-engine cycles. Power 41:173-5 F 2 '15

Is the organism a thermodynamic mechanism.
J. Johnstone. Sci Am S 80:82-3, 106-7 Ag 7-14

Properties of silver iodide interpreted in relation to recent thermodynamic conceptions. G. Jones and M. L.: Hartmann. diag Am Chem Soc J 37:752-75 Ap '15
Steam-engine cycles. Power 41:210-11 F 9 '15
Theoretical efficiency of heat engines. F. G. Gasche. Power 41:753-4 Je 1 '15
Theoretical efficiency of heat engines. R. C. H. Heck. Power 41:534-6; 42:131 Ap 20, Jl 27 '15

Thermal principles of the blast furnace. J. E. Johnson, jr. Met & Chem Eng 13:718-20, 787-92, 833-40 O 15-N 15'15

Thermodynamic paradox; abstract. A. F. Engel. Am Soc M E J 37:652 N '15
Thermodynamics of the marine oil engine.
J: F. Wentworth. Power 41:145-8 Ja 26 '15 See also Heat engines; Steam; Steam en-

gines

Thermoelectricity
Thermoelectric properties of carbon. W: C.
Moore. Am Chem Soc J 37:2032-7 S '15

Thermoelement. See Thermopiles

Thermometers and thermometry
Brief history of the thermometer, W. S. Atchison. Power 41:575 Ap 27 '15

Emergent stem correction for thermometers in creosote oil distillation flasks, R. M. Wil-helm, diags U S Bur Stand Tech Pa 49:1-21

Freezing point of benzene as a fixed point in thermometry. T. W. Richards and J: W Shipley. Am Chem Soc J 36:1825-32 S'14

Measurements for the household. U S Bur Stand Circ 55:38-50 '15

New thermochemical method for subdividing accurately a given interval on the thermometer scale. T. W. Richards and T. Thorvaldson. Am Chem Soc J 37:81-6 Ja '15

Notes on thermometers. S. S. Rathbun, diags Power 42:509-10 O 12 '15

Thermometry of low temperatures. Sci Am 113: 265 S 25 '15

Wheatstone bridge for resistance thermometry C. W. Waidner and others, il diags U S Bur Stand Bul 11:571-90 My 27 '15

S e also Calorimeters and calorimetry; Katathermometers; Pyrometers and pyrometry

Thermophones

Thermophones in Kensico dam. W. F. Smith. diags Eng N 72:1172 D 10 '14

Difficulty of measuring heat, with special reference to radiated and convected heat. A. H. Barker and F. C. S. Brendal. Heat & Ven 12: 33-4 Je '15

Thermoelement installations, especially for calor metry. W. P. White, diags Am Chem Soc J 36:1856-68 S '14

Thermoelements of precision, especially for calorimetry, W. P. White, il Am Chem Soc J 36:2292-313 N '14

Various modifications of thermopiles having a continuous absorbing surface, W. W. Coblentz, pls U S Bur Stand Bul 11:131-87 N 15 '14; Abstract, Elec W 64:1163-4 D 12 '14 Sec also Thermo-couples

Thermoregulators. See Thermostats

Thermos bottles

Continuous drop irrigation from a thermos bot-tle. diag Sci Am S 80:77 Jl 31 '15

Thermostats

Chermostats

Alternating current thermoregulator. H. S. Davis. diag Am Chem Soc J 37:1520-1 Je '15

Lecture course on elements of heating. C: A. Fuller. diags Metal Work 84:212-13, 303-4

Ag 13, S 3 '15

Substitute for the twin-bulb trap in toluenemercury thermoregulators. P. B. Davis. diag Am Chem Soc J 37:1198-9 My '15

Test of economy and efficiency of automatic temperature regulation. M. S. Cooley. Heat & Ven 12:46 My '15

Test of economy and efficiency of automatic temperature regulation in office buildings. F. A. Boos. il Heat & Ven 12:54-9 Ap '15

hickeners. See Dorr thickener

Thickeners, See Dorr thickener

Thinking machines

Machine that remembers and forgets, W. H. Dearden, il diag Sci Am 112:246 Mr 13 '15 Thinking machine, planning and theories, S. B. Russell, il Sci Am 113:246+ S 18 '15

Thiocyanates

Researches on hydantions; the interaction of hippuric acid with thiocyanates. T. B. John-son, A. J. Hill and E. H. Bailey. Am Chem Soc J 37:2406-16 O '15

Thionyl chloride

Ction of thionyl chloride on sulfides. H. B. North and C. B. Conover. Am Chem Soc J 37:2486-90 N '15 Action

Third rails

hird rails

Attaching signal wires to third-rail. G. H. Mc-Kelway. il Elec Ry J 45:1038 My 29 '15

Contact conductors and collectors for electric railways. C. J. Hixson. il diags Am Inst E E Pro 34:1477-90 Ag '15

Contact rail installation in England. il diag Elec Ry J 46:154-6 Jl 24 '15

Discussion of contact systems for electric railroads. (See Proceedings for June and August, 1915) Am Inst E E Pro 34:3068-77 D '15

gust, 1915) Am Inst E E Pro 34:3068-77 D
'15
First 2400-volt third-rail line is built. il Eng
Rec 72:40-1 Jl 10 '15
High-voltage third-rail construction. A. H.
Tracy, diags Elec Ry J 45:469-70 Mr 6 '15
Michigan railway's 2400-volt, third-rail line.
il diags map Elec Ry J 45:1144-9 Je 19 '15;
Abstract. Eng M 49:753 Ag '15
New heavy electric railroad opened in Michigan. diags Eng N 74:212-13 Jl 29 '15
New heavy electric railroad opened in Michigan. diags Eng N 74:212-13 Jl 29 '15
Protecting third-rail insulator. il diag Elec
R & W Elec'n 66:1214 Je 26 '15
Protecting third rail. diag Elec R & W Elec'n
67:370-1 Ag 28 '15
Third rail and trolley system of the West Jersey and seashore railroad. J. V. B. Duer, il
diags Am Inst E E Pro 34:1237-53 Je '15;
Abstract. Elec Ry J 46:58-9 Jl 10 '15
Top contact unprotected conductor rail for 600
volt traction systems. C: H. Jones. il Am
Inst E E Pro 34:1283-93 Je '15; Abstract. Elec
Ry J 46:55-6 Jl 10 '15
homson, Elihu, 1853-

Thomson, Elihu, 1853-Elihu Thomson, father of electrical welding. por Mach 21:444-5 F'15 Seventy years of inventions. Sci Am 112:518-19 Je 5 '15

Thomson bridge

Adjustments of the Thomson bridge in the measurement of very low resistances. F. Wenner and E. Weibel. U S Bur Stand Bul 11:65-8 N 15 '14

Chemistry of the incandescent gas mantle. H. S. Miner. Met & Chem Eng 13:50-2 Ja '15; Same. Am Gas Light J 102:65-6 F 1 '15; Same. Sci Am S 79:139 F 27 '15

Thorium Monazite, thorium, and mesothorium. K. L. Kithil, bibliog flow sheet U S Bur Mines Tech Pa 110:1-30 '15

Thorium Continued

Thorium; an American industry—no danger of a shortage. T. Owens. Am Gas Light J 103: 187-8 'S 20 '15

Thorium oxalate

Thorium ammonium oxalate, C. James, C. F. Whittemore and H. C. Holden, Am Chem Soc J 36:1853-6 S '14

Thread cutting machines

hread cutting machines
National-Acme stud and bolt threading machines. il Mach 22:238-41 N '15; Iron Age 96:
976-8 O 28 '15
Thomson thread milling machines for shells
and rifle barrels. il diag Mach 22:237-8 N '15

See also Pipe threading machines

Thread guide

Improved thread guide, il Textile World 49: 331-2 Je '15

Threading machines. See Thread cutting machines

Three-legged stiff frame with hinged column bases; with discussion. N. M. Stineman. W. Soc E J 19:881-920 N '14

Throop college of technology College of technology in the far West. Sci Am 113:90 Jl 31 '15

Thunderstorms
Facts about thunderstorms, Sci Am S 80:37-8
\_Jl 17 '15

Thunder; theories and experiments conducted in an endeavor to solve the problem. W. Schmidt. Sci Am S 79:175 Mr 13 '15

Thurston, Robert Henry, 1839-1903 Sketch. R. C. Carpenter, por Sibley J 29:323-30 Je '15

Thury system. See Electric transmission

Thyroid gland

Therapeutic uses of preparations of the duct-less glands. R. G. Torrey. Sci Am S 80:122-3 Ag 21 '15

Tibet

Commerce

British India. U S Sp Cons Rep 72:561-72 '15 Ticket offices. See Railroads-Ticket offices

Tickets

Suggestions for cards and tickets. Inland Ptr 54:800a-800h Mr '15

Tides

Tide analysis—a simple and inexpensive appa-ratus. E. W. Brown. Sci Am S 79:347 My 29

Tie plates. See Railroad tie plates

Tie-rods

ie-rods
Tie-rods for floor arches, E: Godfrey, Eng N
73:692 Ap 8 '15
Tie-rods for floor arches; a criticism of current practice, F, N, Kneas, diags Eng N 73;
518-19 Mr 18 '15
Tie-rods in tile-arch floors, G, Aus, Eng N
73:743 Ap 15 '15

Ties, Railroad. See Railroad ties

Ties, Steel. See Railroad ties, Steel Tile, Concrete. See Concrete tile

Tile, Hollow, See Hollow tile

iles
Craft of tile-making and its relation to archiceture. J. H. D. Allen. il Am Inst Arch J 3:5-11 Ja '15
Decorative value of tile flooring. Bldg Age 37: 33-4 My '15
Ornamental tile in cornice work, il Bldg Age 37:39-41 Je '15

Nee also Drain tile

Timber

imber
Aeronautical timber; abstract. J. E. Huson.
Am Soe M E J 37:712 D '15
Dry rot in factory timbers. F. J. Hoxie. Eng
Rec 71:336-7 Mr 13 '15
Forest service proposes grading rule for southern yellow pine. Eng Rec 72:55-6 Jl 10 '15
Longleaf pine distinguished visually from loblolly or shortleaf. A. Koehler. il Eng Rec 72:
319-20 S 11 '15
Prevention of dry rot in mill buildings. F. J.
Hoxie. il Eng Rec 71:400-1 Mr 27 '15
Protecting wooden buildings from dry rot. Eng
N 73:498 Mr 11 '15

Specifications for yellow-pine bridge and trestle timbers, Ry Age 59:67-8 Jl 9 '15

See also Forests and forestry; Lumber; Mine timber; Pine; Redwood; Trees; Wood;

Timber preservation. See Wood preservation Timber testing, See Wood-Testing

Timbered houses

Old timbered houses: examples of old post and plaster work of the 15th and the 16th centuries which is seen at its best in England, il Bldg Age 37:65-6 Ag '15

Timbering Excavating and timbering the very deep trenches required in reservoir and other dam construction. J. M. M. Greig. plans Eng & Contr 44:176-8 S 8 '15

Lap-bolted crossbracing in wide and deep cut. il diag Eng N 74:602 S 23 '15

See also Mine timbering; Subway timbering

Timbering, Mine. See Mine timbering

Timbering, Subway. See Subway timbering

Time system of the United States. C: T. Higginbotham. Sci Am S 79:375 Je 12 '15

Time, Geological. See Geological time

Time keeping

Courtesy in timekeeping. N. Hutchings. Iron Age 96:581 S 9 '15

Age 96:581 S 9 '15
Efficiency system for road contractors. J: H.
Hammond. Eng & Contr 43:552-4 Je 23 '15
Field and office methods employed by Louisville water co. in checking construction gang
payrolls. G. D. Crain, jr. Eng & Contr 43:1023 F 3 '15

Importance of personal touch. N. Hutchings. Iron Tr R 57:751 O 14 '15 Timekeeping and cost records for way department. S. Gausmann. Elec Ry J 46:596-8 S 18

Who should keep way department time? Elec Ry J 46:635-6 S 25 '15

Time measurements

Indicating and recording of time, Sci Am S 79: 299 My 8 '15 Time measured graphically, F; R. Honey, Sci Am 113:446 N 20 '15

Time perception

Motion picture magic; playing tricks on time. C. H. Claudy. il Sci Am 112:454-5 My 15 '15

Time signals

Device for receiving wireless time signals. il diag Elec W 65:818-19 Mr 27'15 Records of radio time signals made with a physiological recorder. C. W. Waggoner. il Sci Am S 79:152 Mr 6'15

Time study

ime study
Applying scientific management. H. K. Hathaway. Iron Tr R 57:739-42+, 787-93 O 14-21
'15; Same. Foundry 43:440-4, 502-7+ N-D '15
Cost of loading bricks into a box car by means of a portable belt conveyor. A. C. Haskell. diag Eng & Contr 44:204 S 15 '15
Fixing standard time for a bonus system.
Z. L. Potter. Ry Age (Mech ed) 89:192-3 Ap

Making instruction cards from time studies. D. V. Merrick. Iron Age 95:560-3 Mr 11 '15 Operating a foundry on a scientific basis. F: A. Parkhurst. il Foundry 43:21-6, 53-8 Ja-F '15 Practical utilization of time study data. D. V. Merrick. Ind Eng 15:31-4 F '15 Results of a time study on steam-main construction. Am Gas Light J 103:13 Jl 5 '15 Superintendents can save money by short time studies. A. C. Haskell. Eng Rec 71:341 Mr 13 '15 Time study on excavating and handling material. Munic Eng 49:77 Ag '15 Time study shows expensive defect in cement-

Time study shows expensive defect in cement-handling methods. Eng Rec 72:460 O 9 '15

Use and abuse of time studies. A. A. Dowd. Iron Age 95:300-3 F 4 '15

Utilization of time study data. R. T. Kent. Iron Age 95:1178-81 My 27 '15; Same. Iron Tr R 56:1109-13+ Je 3 '15; Same. Ind Eng 15:98-103 S '15

See also Task system

Timepieces. See Time measurements: Watches

in Investigation of fusible tin boiler plugs. G: K. Burgess and P. D. Merica. il U S Bur Stand Tech Pa 53:1-37 '15: Same cond. J Ind & Eng Chem 7:824-9 O '15; Abstracts. Iron Age 95:1403-4 Je 24 '15: Am Gas Light J 15: Now 1 1:1 Am Som M E J 37:664 N '15: Power 42:733-4 N 23 '15

Pearce assay for tin. Eng & Min J 98:1142 D

Situation in tin. Eng & Min J 99:588 Mr 27 '15
Tin production. Metal Work 83:936-7 Je 25 '15
Tin production in the United States, 1914. Eng
& Min J 99:66-8 Ja 9 '15
Use of hydrofluoric acid in the separation of
copper and lead from tin and antimony
by means of the electric current. L. W. McCay. Am Chem Soc J 36:2375-81 N '14

Tin metallurgy
Attempt at tin concentration. J. Simmons. il
Eng & Min J 99:816-17 My 8 '15
Tin-ore dressing at Llallagua, Bolivia. D. Copeland and S. E. Hollister. il diags Eng & Min
J 100:461-4, 513-15, 555-8 S 18-O 2 '15

Tin mines and mining
Hydro-electric plant at a Bolivian tin mine.
M. R. Lamb. il Eng & Min J 99:7-9 Ja 2 '15
Prospecting for tin. Eng & Min J 99:295 F 6

Tin mining in Alaska. map Eng & Min J 100:

838-9 N 20 '15
Tin mining in Bolivia. M. G. F. Soehnlein. Eng & Min J 99:143-5 Ja 16 '15
Tin mining in Bolivia. M. R. Lamb. Eng & Min J 99:605-6 Ap 3 '15
Tin-ore dressing at Llallagua, Bolivia. D. Copeland and S. E. Hollister. il Eng & Min J 100: 461-4 S 18 '15
Trip through Bolivia. S. C. Bullock. il Eng & Min J 100:421-4 S 11 '15

Tin plate
How tin plate is made in Germany. Von W.
Kramer, diags Iron Tr R 57:359-60 Ag 19 '15
Metal, tin-plate and sheet prices for seventeen years, Iron Age 95:24-24a, Ja 7 '15
Sheet and tin-plate trades in 1914. B. E. V.
Luty. Iron Age 95:10-11 Ja 7 '15

Tinning Determining price for tinning utensils. Metal Work 84:651+ N 19 '15
Method of retinning copper ware. H. F. Munro. Metal Work 83:474 Mr 26 '15
Tintic mining district. See Geology—Utak.

Tire fabrics

Tests for tire fabrics, il Textile World 49:562-4 Ag '15

Tire pumps

Engine-driven tire pumps for 1915, diags Automobile 32:330-5 F 18 '15

J. M. engine-driven tire pump. il Horseless
Age 35:571 Ap 28 '15

Stewart pump supplies cool air. Automobile 33:303 Ag 12 '15

Temperature variation of air from hand and power tire pumps. G. Adams, Horseless Age 36:177 Ag 15 '15

Tire sustaining pump. diag Horseless Age 35: 752 Je 2 '15

Annealing oven for tires, W. E. Grum-Grzimailo, diags Iron Age 94:1397 D 17 '14
Danger of welding processes as applied to tires and wheels. M. D. Hayes, il Elec Ry J 45:942-4 My 15 '15

45:942-4 My 15 '15 Electric heater for shrink fits, il Elec Ry J 46:960-1 N 6 '15

Sizes required of wheels and tires in heavy traffic, for road protection. Automobile 32:1083 Je 17 '15

Suggestions regarding the determination of the properties of steel. A. N. Mitinsky. Am Inst Min E Bul 104:1697-1705 Ag '15; Abstract. Proportional limit is prime factor) Iron Tr R 57:1184-6 D 16 '15; Discussion. Am Inst Min E Bul 108:2481-95 D '15

Tires (automobile) Bostonian argues for resiliency as the measure of tire efficiency. Automobile 33:16-18 Jl 1 '15 Carrying capacities and tire pressures. H. S. Quine. Automobile 33:427 S 3 '15

Clincher vs. straight side tires. C: E. Duryea.
Horseless Age 35:167 F 3 '15
Cord tire—its origin, development and construction. J: F. Palmer. diags Automobile 32:1020-2 Je 10 '15
Cord tires score in road racing. il Automobile 33:366-7 Ag 26 '15
English tire advertisers hit at competitors.
Horseless Age 35:353 Mr 10 '15
Hard-base solid tires gain followers. il Automobile 33:961-2 N 25 '15
Heating motor truck steel tires electrically.
Mach 22:5 S '15
Heavy duty truck tires. il Munic Eng 49:158-9
O '15
High tire prices not to last long. Horseless

High tire prices not to last long. Horseless Age 34:305 Ag 26 '14
How to make tires last longer. Horseless Age 35:641 My 12 '15
Makers should base tire equipment on car weight. C: B. Whittelsey. Automobile 32:38-9
Ja 7 '15

Ja 7 '15 Measuring the hardness and elasticity of rubber, il Sci Am 113:236 S 11 '15 New tire for motor trucks, diags Eng & Contr 44:54 Jl 21 '15 Pros and cons of tire inflation. C: B. Whittelsey, Horseless Age 35:61-2 Ja 13 '15 Resilience no true gauge for tire efficiency and efficiency no measure of needs. Automobile 32:1037-40 Je 10 '15 Size and inflation of pneumatic tires. P. W. Litchfield, Horseless Age 35:805-6 Je 16 '15 S. A. E. advances. Automobile 31:1148-9 D 24 '14

'14
Sponge rubber with nitrogen under tension for filling tires. Automobile 32:993 Je 3 '15
Tire makers enlarge plants and develop product. il Automobile 33:955-60 N 25 '15
Tire qualities demanded if air tires were discarded, diag Automobile 32:810-11 My 6 '15
Tire sizes standard. Automobile 32:85 Ja 14 '15
Tires and tire sundries, rims and wheels at the New York show. H. H. Brown. diags Horseless Age 35:108-9 Ja 20 '15 See also Tire pumps

### Repair

A. C. A. tests tireseal and multiple rings. Automobile 32:110+ Ja 21 '15 How to splice inner tubes. Automobile 33:243 Ag 5 '15

Relation of tire repairing to the garage. M. E. Faber. Horseless Age 35:640 My 12 '15 Tireseal

c. C. A. makes two certified tests. Horseless Age 35:122 Ja 20 '15 . C. A. tests tireseal and multiple rings. Automobile 32:110+ Ja 21 '15

Titanium

Effect of titanium alloys on steel. G: F. Comstock. il Iron Tr R 57:391-5+ Ag 26 '15
Has titanium any influence on the properties of steel? F. A. J. FitzGerald. diags Met & Chem Eng 13:28-9 Ja '15; Same cond. Iron Age 95:309 F 4 '15; Summary. Elec Ry J 45: 98 Ja 9 '15
How titanium church

98 Ja 9 '15
How titanium-aluminum bronze is produced.
C. Vickers. il Foundry 43:273-8 JI '15
Slags from titaniferous ores. F. E. Bachman.
diag Iron Tr R 55:1040-2 D 3 '14
Titanium aluminum bronze. W. M. Corse and
C. Vickers. Metal Ind n s 13:190-1 My '15
Titanium-aluminium bronze castings. W. M.
Corse. Met & Chem Eng 13:511-12 Ag '15
Titanium-aluminium bronze castings. W. M.

Titanium and its effects on steel. G: F. Com-stock. il J Ind & Eng Chem 7:87-94 F '15; Same cond. Sci Am S 80:327 N 20 '15

Titanium and titaniferous ores. P. H. Berg-green, Sibley J 29:227-30 Ap '15

Volumetric estimation of titanium by means of ferric culoride. T. R. Ball and G. M. Smith. il Am Chem Soc J 36:1838-43 S '14

Titration. See Volumetric analysis

Titration (water measurement). See Water flow Titusville, Pennsylvania

## Politics and government

Year of the commission-manager plan at Titusville, Penn. L. O. Bradley. Eng N 72: 1155 D 10 '14

Toads. See Tree toads

Tohacco Detoxication of tobacco. Sci Am 112:101 Ja 30

Tobacco trade of the world. U S Sp Cons Rep 68:1-48 '15 68:1-48

Toilet articles

British India. U S Sp Cons Rep 72:276-85 '15

Toilet rooms

Home plant sets example in sanitation: plumbing equipment of the Trenton potteries co. il Metal Work 82:749 D 4 '14 Modern toilet rooms in public schools. J. Graham. plans Dom Eng 70:332-4, 402-5 Mr 13, 27 '15

27 '15
Plumbing in toilet of railway station, il plans
Metal Work 83:117-18 Ja 15 '15
Saving space in sanitary plans, il plan Metal
Work 83:469-70 Mr 26 '15
Toilet regulations for industrial establishments: report of committee, Boston Soc
C E J 2:73-89 F '15; Same cond. (Sanitation
in shops and factories) Eng M 49:100-1 Ap

See also Bathrooms; Public comfort stations; Schoolhouses—Toilet rooms; Water closets

## Toledo, Ohio

### Wharves

Toledo coal dock built in record time, il plan Eng N 74:520-2 S 9 '15

Tolerances. See Fitting (machinery)

Recovery of toluene from gas. diags J Ind & Eng Chem 7:438-9 My '15 Toluene recovery plant at Beckton, England. plan Am Gas Light J 102:332 My 24 '15

Toluidides

Tolyl esters and toluidides of the nitro-sulfonic acids of p-xylene. R. C. Huston. Am Chem Soc J 37:2119-22 S '15

Dr. Rittman's gasoline process. Sci Am. 248 Mr 13 '15
Increased gasoline yield and toluol from petroleum. Am Gas Light J 102:156-7 Mr 8 '15
Rittman process of cracking. C. H. Claudy. il Sci Am 112:267 Mr 20 '15

Tomatoes

omatoes
Canned-tomato industry in Italy, J. A. Shriver, U S Bur For & Dom Com 93:1-23 '15
Examination of tomato pulp, W. D. Bigelow and F. F. Fitzgerald, J Ind & Eng Chem 7: 602-6 Jl '15
Iron in tomatoes, C. A. Brautlecht and G. Crawford, J Ind & Eng Chem 6:1001-2 D

Tonnage, Train. See Railroads-Train load

Tonopah mining companies Tonopah in 1914. F: Bradshaw. Eng & Min J 99:154-5 Ja 16 '15

Tool holders

ool holders Cutting tool holders. il Iron Age 95:559 Mr 11 '15 J. H. Williams & co.'s tool-holders. il Mach 21:589-90 Mr '15 Lathe tool holder with stellite cutter. diag Iron Age 96:979 O 28 '15 Peerless drill and reamer holder. il Mach 21: 838-9 Je '15 Rigid horing-tool system, il Elec W 66:604-5

Sab Je 13 Rigid boring-tool system, il Elec W 66:604-5 S 11 '15; Metal Ind n s 13:385 S '15; Ry Age (Mech ed) 89:595-6 N '15 Turning tool-holders. J. Horner, diags Mach 21:955-61; 22:6-9 Ag-S '15

Tool steel

Cause of high speed steel tool failures. G: J. Brunelle. Ry Age (Mech ed) 89:369-70 Jl '15 Cobalt steel; material for accelerating machine tool speeds and output. Sci Am S 79:379 Je 12

Cutting tools. il Engineer 119:275-7 Mr 19 '15 Effect of chromium and tungsten upon the hardening and tempering of high-speed tool steel; abstracts, with discussion. C. A. Edwards and H. Kikkawa. Engineer 120:313-14 O 1 '15; Iron Age 96:1126-7 N 11 '15

Factors in hardening tool steel; abstracts, J: A. Mathews and H. J. Stagg. Elec Ry J 44:1249-50 D 5 '14; Iron Age 94:1340-4 D 10 '14; Mach 21:396-9 Ja '15; Ind Eng 15:58-9

F '15; Ry Age (Mech ed) 89:243-7 My '15; Iron Tr R 57:184-7+ Jl 22 '15; Abstract, with discussion. Am Soc M E J 37:141-7 Mr '15 Failure and heat treatment of drill steel. S. V. Bergh. il diags Eng & Min J 99:612-14 Ap 3

Failure of hollow drill-steel. T. E. Sturtevant. Eng & Min J 99:579 Mr 27 '15
High speed tool steels. F: C. A. H. Lantsberry. il Iron Age 96:238-41 Jl 29 '15; Abstract. Am Soc M E J 37:299 My '15
Machine steel for small tools. O. D. Kinsey. il diags Ry Age (Mech ed) 89:189-90 Ap '15
Positive identification of tool steels. Iron Age 96:200 Jl 22 '15
Progress in machine shop methods. E. R. Norris. il Iron Tr R 57:679-82+ O 7 '15
Running tool steel pinions with soft steel gears; abstract. E. S. Sawtelle. Ind Eng 14: 467 D '14
Structure of carbon tool steel. J. V. Emmons.

467 D '14
Structure of carbon tool steel. J. V. Emmons. il Iron Age 95:842-3 Ap 15 '15
Surface decarbonization of tool steel. J. V. Emmons. il Am Inst Min E Bul 93:2233-48 S '14; Same cond. Iron Tr R 55:727+ O 15 '14; Same cond. Iron Age 94:1288-90 D 3 '14; Abstract. Am Soc M E J 36:0198-9 O '14; Abstract. Ind Eng 15:27-8 Ja '15; Discussion. Am Inst Min E Bul 100:790-4 Ap '15
Testing tool steels; abstract. A. B. Field. Am Soc M E J 37:658 N '15
Why tool steel prices have gone up. E. C. Kreutzberg. Iron Tr R 57:987 N 18 '15

ny tool steel prices have gone up. Kreutzberg. Iron Tr R 57:987 N 18 '15

Gols
Brown & Sharpe machinists' small tools, if Mach 21:759-60 My '15
Care and use of the cabinet scraper, C: A. King, diags Bldg Age 37:37-8 Jl '15
Illimois Central tool system; standardization and distribution include a central tool room with an accurate cost system, O. D. Kinsey, il Ry Age (Mech ed) 89:361-4 Jl '15
Machine steel for small tools, O. D. Kinsey, il diags Ry Age (Mech ed) 89:189-90 Ap '15
Safe hand tools, il Iron Tr R 56:523-4 Mr 11
'15; Same, Eng & Min J 99:531-2 Mr 20 '15;
Same, Ind Eng 15:19-20 Ja '15
Taft-Peirce tool-room specialties, il Mach 21: 835-7 Je '15
Tool equipment for maintenance of way forces.

Tool equipment for maintenance of way forces. Ry Age 59:337-41 Ag 20 '15 Up-keep of track tools. M. E. Carroll, il Ry R 57:341-3 S 11 '15

See also Augers; Machine tools; Machinery; Railroads—Tools and implements; Saws; Square (instrument); Tool steel

Tools, Machine. See Machine tools Tools, Military. See Military tools

Tools, Pneumatic. See Pneumatic tools

Topographic maps
Topography of the bed-rock under Chicago.
R. Peattie. maps W Soc E J 19:590-4 Je '14;
Same cond. Eng & Contr 42:605-7 D 30 '14;
Discussion. W Soc E J 19:594-611 Je '14

Topographical drawing
Maps and map making. T: H. Holdich. Sci Am
S 79:38-9 Ja 16 '15
Platting topography to distorted scale (valuation board requirement). Eng N 73:123-4 Ja
21 '15

Speeding up the plane table. R. T. Hancock. Eng & Min J 100:840-1 N 20 '15

Topographical surveying
Cost of topography for irrigation work in
British Columbia. B. P. Little. Eng & Contr42:384-5 Ap 28 '15

How the government makes surveys for local use. G: O. Smith. Eng Rec 71:682-3 My 29

Methods and cost survey of Trinity river, Texas. T. H. Jackson. Eng & Contr 44:271-3 O 6 '15

3 O 6 '15
Need of a city plan and of a city topographic map. J. W. Shirley. Eng N 73:281-2 F 11 '15
Propriety of government surveys for local use.
W. N. Brown. Eng Rec 72:85-6 Jl 17 '15
Reasons for city topographic survey. H. C. Mitchell. Eng N 73:280-1 F 11 '15
Topographic survey of the city of Dayton, Ohio. R. H. Randall. Eng N 74:942-3 N 11 '15
Topographic surveys for logging operations.
E. A. Marshall. il diag Eng N 73:1112-15 Je. 10 '15

Topography. See Topographical drawing

How a top stands up. J. Swinburne. Inst E E J 53:349-50 Mr 1 '15; Same; with discussion. Sci Am S 80:197 S 25 '15

Toronto, Ontario

### Harbor

Harbor developments at Toronto, Ont. Eng & Contr 43:sup21 My 26 '15 Toronto breakwater to curb 10-foot waves. diags Eng Rec 70:694-6 D 26 14

### Railroads

Grade crossing elimination in North Toronto, Ontario, il diag plan Ry Age 59:555-8 S 24 '15

### Streets

Brick paving on steep grades, F. A. Churchill, il Munic Eng 48:105-8 F '15

Torpedo boat berth

Concrete pile and cylinder foundations at Charleston, il diag Eng N 74:926-9 N 11 '15 Torpedo-boat berth at the Charleston navy yard, il plan Eng N 74:872-3 N 4 '15

Torpedo boat destroyers

orpedo boat destroyers
Bids for new United States destroyers. Int
Marine Eng 19:553 D '14
Latest French destroyers. il Int Marine Eng
20:168-9 Ap '15
Launch of the U. S. destroyer, Cushing. il Int
Marine Eng 20:88 F '15
Unprecedented accident to a torpedo-boat destroyer: the Aylwin. il Sci Am 112:71 Ja 16
'15

Torpedo boats

Superheated steam in torpedo-boat engines, W. H. Miller, Sci Am 113:33+ Jl 3 '15 Turbine installation on torpedo boats of the new Spanish navy. Int Marine Eng 20:516 N

See also Torpedo boat destroyers

## Torpedo mines. See Mines, Submarine

Torpedoes

Automobile torpedo. diags Engineer 120:77-9

J1 23 '15 Automobile torpedo; its problems and their solution, il diags Sci Am S 80:152-4 S 4 '15 Gyrostatic action, J. G. Gray, diags Sci Am S 79:188-9 Mr 20 '15 Leon torpedo, diag Engineer 120:196-7 Ag 27

'15
Loading and firing submarine torpedoes. Sci
Am 112:493 My 29 '15
Modern automobile torpedo. E; F. Chandler. il
Sci Am 113:112-14+ Ag 7 '15
Protection against torpedoes. Engineer 119:41-2
Ja 8 '15; Same. Sci Am S 79:107 F 13 '15
Submarines and torpedoes. C. N. Hinkamp. il
plan Sci Am S 80:136-8 Ag 28 '15; Same
cond. Engineer 120:19 Jl 2 '15; Same cond.
Eng N 74:698-9 O 7 '15
Torpedo attack from the air Sci Am 111:523

Torpedo attack from the air. Sci Am 111:523 D 26 '14

Scc also Mines, Submarine

Torque

Mechanical effects of electrical short-circuits, S. H. Weaver. Gen Elec R 18:1066-74 N '15 Torque characteristics of direct-current mo-tors, A. M. Bennett. diag Power 42:748-52 N 15

Torres y Quevedo, Leonardo de Torres and his remarkable automatic devices. il diags Sci Am 8 80:296-8 N 6 '15

Torsion

Angle of torsion. B. D. Pinkney. diags Mach 22:58 S '15 Angle of torsion. W. B. Gilbert. diag Mach

21:831 Je '15

Torsional strengths of guy anchor rods. T. Croft. diags Elec W 65:1607-9 Je 19 '15

Tourville (battleship)
New French battleship Tourville. M. K. Barnett. il diag Sci Am 113:45 Jl 10 '15

Towboats

Diesel motor tug Chickamauga. G: E. Nicholson. il Int Marine Eng 20:493-5 N '15

Government towboat Warioto. plans Int Ma-rine Eng 20:487-8 N '15

Sea-going steel tug, Bristol, il plan diag Int Marine Eng 20:78-9 F'15 Western river steamers and barges. E. A.

estern river steamers and barges. E. A. Burnside. il plan Int Marine Eng 20;478-87

Towers

Church towers, steeples, and spires of Sir Christopher Wren. W. R. Phillips. il Brickb 24:185-9, 228-32 Ag-S '15
Design and construction of the 435-ft. steel framed tower of jewels at the Panama-Pacific international exposition. F. S. M. Harris. il diags Eng & Contr 43:47-54 Ja 20 '15; Same cond. Eng N 73:866-72 My 6 '15; Same cond. Eng Rec 71:112-16 Ja 23 '15
Earthquake-proof tower. C. Derleth, jr. il Eng M 49:927 S '15
Reinforced-concrete cap of Perry memorial column. H. C. Baird, diags Eng N 74:154-5

einforced-concrete cap of Perry memorial column. H. C. Baird, diags Eng N 74:154-5 Jl 22 '15

J1 22 '15 Sulphite-solution plant of reinforced concrete: four 99-foot towers 8.5 feet in diameter with a special tile lining, il Eng Rec 70:610 D 5 '14 Towers for radio-telegraph stations, il diags Engineer 119:427-8 Ap 30 '15

Towers, Hoist. See Hoist towers Portable Towers,

Portable tower for maintenance of lamps. diag Elec W 66:144 Jl 17 '15 street

Towers, Steel Clean-up w

owers, Steel
Clean-up work after erecting three 600-ft. radio towers. Eng N 74:28 Jl 1'15
Foundations for high towers at Darien, C. Z.
I. W. Dye. il diag Eng N 73:1178-9 Je 17'15
Foundations for transmission line towers and tower erection. J. A. Walls; J. B. Leeper; W. E. Mitchell; P. M. Downing; F. C. Connery. diags pls Am Inst E E Pro 34:1167-97, 1369-77 Je-Jl'15; Abstract. Elec W 66:8-10
Jl 3'15
Method of erection

Method of erecting Marconi masts. L. bles, il diag Eng N 73:11324 Je 10 '15 600-ft, self-supported radio towers at Darien, C. Z. I. W. Dye, il diag Eng N 73:1228-31 Je 24 '15

Weakness in steel towers. B. Haskell. Elec W

65:204-5 Ja 23 '15

Towers, Transmission
Construction of tower foundations; abstract.
F. C. Connery. diags Elec W 66:136 Jl 17

Design of transmission towers for the Cohoes hydroelectric plant analyzed diags plan Eng Rec 71:677-8 My 29 '15 Foundations for transmission line towers and

Fec 71:677-8 My 29 '15
Foundations for transmission line towers and tower erection, J. A. Walls; J. B. Leeper; W. E. Mitchell; P. M. Downing; F. C. Connery, diags pls Am Inst E E Pro 34:1167-97, 1369-77 Je-Ji '15; Abstracts. Elec W 66:8-10
Jl 3' '15; Eng N 74:159-61 Jl 22' '15; Discussion, Am Inst E E Pro 34:3117-26 D '15
New Carquinez Straits high-tension crossing, il Eng N 74:248-9 Ag 5' '15
One boiler room instead of fifty; Cabin Creek plant of the Virginia power company, il diags Elec W 66:286-91 Ag 7' '15
Plan to defeat rust on legs of transmission-line towers. il Elec W 66:1990 N 13' '15
Steel-tower, transmission-line construction. A. B. Cudebec. il Elec W 66:17-33 Jl 17' '15
Tower foundations for the Cristobal-Balboa transmission line. I. W. Dye, il diags Eng Soc W Pa 30:973-90 Ja '15; Same, Ry R 56: 728-31 My 29' '15; Same cond. Eng & Contr 41:317-20 O 20' '15
Transmission towers of 3-in, pipe, il diag Elec W 66:574 S 11' '15
Wooden river-crossing towers, il diags Elec W 66:574 S 11' '15

Wooden river-crossing towers, il diags Elec W 66:586-7 S 11 '15

See also Electric lines

Towing

owing
Electric towing at Panama. il diag Elec Ry
J 45:235-7 Ja 30 '15
Towing locomotives for the Panama canal.
C. W. Larson. il diag Gen Elec R 18:101-17
F '15; Same cond. Eng N 73:145-7 Ja 28 '15;
Ry Age 58:189-91 Ja 29 '15; Elec R & W
Elec'n 66:187-91, 233-7 Ja 30-F 6 '15; Elec W
65:288-90 Ja 30 '15; Eng Rec 71:134-6 Ja 30
'15; Ry R 56:150-3 Ja 30 '15; Sci Am S 79:72-4
Ja 30 '15; Eng M 48:744-8 F '15; Int Marine
Eng 20:161-2 Ap '15; Engineer 119:323-5 Ap
2 '15

Track-clearance records. See Railroads-Clearance

Track inspection. See Railroads-Track inspection

Track scales

Foundation, construction and care of track scales. A. Malmstrom. Ry Age 58:269 F 12 15

Proposed rating system for track scales. A. M. Van Auken. Eng N 74:115 Jl 15 '15

## Testing

Adjusting railroad track scales, H. L. Van Keuren, Ry Age 59:958-60 N 19 '15 Relative merits of long and short wheel base scale-testing cars, C. A. Briggs, il diags Ry R 57:197-201 Ag 14 '15

Track stresses. See Rails-Stresses

### Tracks

Plank track carries drag-line excavator half mile in 10 hours, diag Eng Rec 71:152 Ja 30

Tracks, Mine. See Mine tracks

Tracks, Railroad. See Railroads—Track; Street railroads—Track

Traction engines. See Tractors

Tractive effort
Diagram for determining percentage of maximum tractive effort, L. R. Pomeroy, Ry Age
(Mech ed) 89:453-4 S '15

See also Locomotives-Performance

Tractors

American caterpillar traction engine. Engineer

120:255 S 10 '15 Bull tractor, il Munic J 39:237 Ag 12 '15 Centiped tractor truck, il Munic Eng 49:83 Ag

Bull tractor. il Munic J 39:237 Ag 12 '15
Centiped tractor truck. il Munic Eng 49:83 Ag
'15
Coming of the motor plough. il diag Engineer
120:361-4, 408-10 O 15, 29 '15
Creeping grip tractor. il diags Engineer 119:
560-2 Je 4 '15
Demand for small tractors. Am Ind 16:39 O '15
Farm tractor field widens. P. S. Rose. Automobile 33:752-3 O 21 '15
Farm tractors and their motors. P. S. Rose.
Horseless Age 35:799-800 Je 16 '15; Abstract.
Eng M 49:750-2 Ag '15
Four-wheel drive for motor tractors. Horseless Age 36:367-8 O 15 '15
France to subsidize farm tractors. il Automobile 33:644-5 O 7 '15
General purpose gasoline tractor, il Eng & Contr 42:167 Ag 12 '14
Genesis of the traction engine. J. L. Mowry.
Assn Eng Soc J 54:44-8 Ja '15
Good tractor. il Engineer 120:66-7 Jl 16 '15
Gray tractor. il Munic J 39:377 S 2 '15
Harvesting grain by motor power. il Sci Am
112:612 Je 19 '15
Interesting forms of farm truck-tractors. V:
W. Page. il diags Sci Am 113:344 O 16 '15
Knox 10-ton tractor. il diags Horseless Age 35:
308-9 Mr 3 '15; Automobile 32:416-19 Mr 4
'15; Eng & Contr 43:232-3 Mr 10 '15; Eng N
73:504-6 Mr 11 '15
Knox tractors doing heavy hauling. il Eng &
Contr 44:297 O 13 '15
Light tractors for industrial service. il Eng N
73:1019 My 27 '15
Long chances with the portable engine. L.
Addy. Power 41:814-15 Je 15 '15
Mercury freight house tractor truck. il Ry
Age 58:361-2 F 26 '15
Operation analysis of new machines which
cheapen the moving of earth on road work.
A. B. McDaniel. il Eng Rec 72:126-8 Jl 31 '15
Performance of a small gasoline tractor with
caterpillar pilot-wheel. J. G. Bennett. il Eng
N 73:494-5 Mr 11 '15
Powerful motor tractors. Sci Am 111:55 D 26
'14
Progress in small farm tractors. L. W. Ellis.
il Sci Am 112:306-8 Ap 3 '15

'14
Progress in small farm tractors. L. W. Ellis. il Sci Am 112:306-8 Ap 3 '15
Road tractors. F. H. Trego. Horseless Age 35: 797-8 Je 16 '15
Royal agricultural show at Nottingham. il Engineer 120:30-1 Jl 9 '15
Small caterpillar tractors for miscellaneous hauling. il Eng N 72:1316 D 31 '14
Small farm tractor. Sci Am 112:304 Ap 3 '15

10,000 farmers at tractor test. Automobile 33: 308 Ag 12 '15

308 Ag 12 '15 10-ton tractor for horse trucks. il Iron Age 95:509 Mr 4 '15

Theory of resistance to rolling of a hard body over a plastic surface; abstract. B. E. Schultz. Am Soc M E J 37:478-9 Ag '15 Tractor truck for contractors' hauling. il Eng & Contr 43:185 F 24 '15; Munic J 38:447-8 Ag I '15 Universal tractor co.'s tractors. il Horseless Age 34:886 D 16 '14. Wide-spread use of the steam road locomotive in England. il Sci Am 113:471 N 27 '15

See also Electric tractors; Gas tractors

## Trade acceptances

Use of trade acceptances in business. E. F. DuBrul, Am Ind 16:25-7 N '15

## Trade agreements

United States commission on industrial relations makes report of progress. Iron Tr R 55:1100-1 D 10 '14

See also Arbitration, Industrial

### Trade associations

Commercial organizations in the United Kingdom with a description of British manufacturers' and employers' organizations, A. J. Wolfe. U S Bur For & Dom Com 102:41-53

Man who wouldn't join. K. C. Cardwell. Dom Eng 69:332 D 12 '14 Master mechanic and general contractor. E. B. Tonnesen. Metal Work 83:296-7 F 19 '15

## Trade catalogs. See Catalogs

Trade commission, Federal. See United States—Federal trade commission

### Trade marks

Fade marks
British India, U S Sp Cons Rep 72:138-44 '15
Cancelation of the ten-year clause. Sci Am
113:84 Jl 24 '15
Detroit's trade-mark contest. Sci Am 112:323
Ap 3 '15
Register trade marks in Latin America. Automobile 33:411 S 2 '15
Ruling affecting owners of trade marks. H: C.
Thomson. Textile World 48:379 Ja '15

## Trade papers

rade papers
Money and time saving recording systems;
reading of trade journals and books. R. T.
Gebler. Metal Work 84:300-2 S 3 '15
News service of trade and technical press.
W. H. Taylor. Metal Work 83:649 Ap 30 '15
Profit from reading their trade paper. il Metal
Work 83:439+ Mr 19 '15
Trade papers adopt standards of practice. Elec
R & W Elec'n 67:537 S 18 '15

# Trade schools

Machine design in a Rhode Island school. W. E. Freeland, il diags Iron Age 96:1105-7 N 11 '15

Teaching shop work. Mach 21:975 Ag '15 Trade school idea at Gary, Ind. il Bldg Age 37:25-8 S '15 Training carpenters for the trade at Bridge-port. J. F. Johnson. il Am Ind 15:26-8 Mr

Vocational training in French cities. F. Glynn, il Metal Work 82:760-1+ D 11 '14 See also Corporation schools: Industrial education

### Trade unions

Commercial organizations in the United Kingdom with a description of British manufacturers' and employers' organizations.
A. J. Wolfe. U S Bur For & Dom Com 102:

Employer sustained in excluding union men. Ry Age 58:208 Ja 29 '15

Legal decisions on mining questions: miners may legally join labor organizations. Colliery 35:396 F '15

See also Arbitration, Industrial: Employers' associations; Labor and laboring classes; Open and closed shop; Picketing; Strikes; Trade agreements

## Trade waste

Determination of the biochemical oxygen demand by the saltpeter method in stockyards, tannery and corn products wastes. A. Lederer. J Ind & Eng Chem 7:514-16 Je '15

Trade waste—Continued
Disposal of cannery wastes. D. Englis. Munic
J 38:68-9 Ja 21 '15
Experience gained in the treatment of the
wastes from the scouring of wool. H. R.
Crohurst and A. D. Weston. Eng & Contr
44:370-6 N 10 '15
Liquid trade wastes. Sci Am S 80:51 Jl 24 '15
Maintenance of sewers and disposal works demands treatment of injurious trade wastes.
W. L. Stevenson. Eng Rec 71:256-60 F 27 '15
Processes available for the treatment of industrial wastes. Eng & Contr 48:363-5 Ap
21 '15

Summary of the results of experiments on the purification of creamery refuse and their application. H. R. Crohurst and A. D. Weston, Eng & Contr 44:7-9 Jl 7 '15
Test plant operated to deodorize oil refinery wastes. F. R. Hesser, il diags Eng Rec 72: 541-2 O 30 '15

Trades schools. See Trade schools

Trading stamps

Trading stamps and premium legislation. E. J. Buckley. Metal Work 83:753 My 21 '15

Traffic league, National industrial. See National industrial traffic league

Traffic regulation. See Street traffic

Traffic signs

Semaphore type of street signal, diag Eng N 74:511 S 9 '15 Street traffic signals, Cleveland, O. il Munic J

Traffic-control signal, il plan Eng N 74:320 Ag

Traffic signal for fire apparatus. Munic J 39:

Trainc signal for fire apparatus. Mulife J 53. 328 Ag 26 '15 Traific warning signs. H. M. White. il Munic J 38:658 My 13 '15 Warning semaphore with light and horn for fire engines. Munic J 39:329 Ag 26 '15

Traffic surveys. See Road traffic; Street rail-roads—Traffic; Street traffic

Trailers. See Street cars—Trailers; Street rail-roads—Trailer operation

Train dispatchers

Duties of a train despatcher. Ry Age 59:318 Ag

Train despatcher as a revenue solicitor. J. L. Coss. Ry Age 59:322 Ag 20 '15

Train dispatchers' association of America 28th annual convention, St. Paul, Minn., June 15. Ry Age 59:16-17 Jl 2 '15

Train dispatching

Automatic telephone system at the Kansas City terminal. il Ry R 55:768-70 D 26 '14 Dead train orders. J. L. Coss. Ry Age 57:1122-3 D 18 '14

D 18 Radio telegraphy and telephony for railroads. J: L. Hogan, jr. il diags Elec W 66:570-2 S 11 '15

Telephone train dispatching on the Cedar Rapids & Iowa City railway, il Elec Ry J 44:1309 D 12 '14

Train despatcher—who has no grievance com-mittee, W: E. Watts. Ry Age 58:217-18 F 5 mittee,

Vireless telegraph and D. L. & W. R. R. L. 56:491-3 Ap 10 '15 Wireless nd telephone on the L. B. Foley, il Ry R the

Train ferries. See Car ferries

Train indicators

National train indicators at Kansas City, il Ry Age 58:272-3 F 12 15

Train indicators at Euston, London, station. il Ry Age 58:739 Ap 2 '15

Train lighting. See Car lighting

Train load. See Railroads-Train load

Train resistance

Hump-yard calculations. C. C. Wentworth. Eng N 74:750 O 14 '15

Rolling resistance of cars over switches a frogs. C. L. Eddy. Ry Age 58:796-8 Ap 9

Scientific train loading; tonnage rating. O. S. Beyer, jr. Ry Age 59:507-11 S 17 '15; Same. Ry Age (Mech ed) 89:502-5 O '15; Same abr. Ry R 57:594-8 N 6 '15

Starting resistance of electric cars. F. E. Wynne. Elec Ry J 46:401-2 S 4 '15

ests of car resistance. C. L. Eddy. Eng N 73:899-900 My 6 '15; Same. Sci Am S 80:111 Ag 14 '15 Ag 14

Train resistance of electric cars at starting. D. D. Ewing. Elec Ry J 46:279-80, 637 Ag D. D. Ewing 14. S 25 '15

Train sheds. See Railroads-Train sheds Train staff. See Railroads-Signals

Trains. See Railroads-Trains Trains, Hospital. See Hospital trains

Trainsheds. See Railroads-Train sheds

Trans-Siberian railway. See Siberian railway Transit, Surveyors'

Horizontal cross-hair adjustment of the engineer's transit. M. F. Sayre. Eng N 73:396 F

New Smith solar åttachment. A. D. Kidder. il Eng N 73:1068-70 Je 3 '15
One-piece trussed transit standards. il Eng N 74:1056 N 25 '15

Transmission of power. See Power transmission

Transportation

ransportation
American engineer in China. W: B. Parsons. il map J Fr Inst 179:381-413 Ap '15; Abstract. Eng M 49:430-4 Je '15
Economic elements involved in transportation and communication problems on country roads. Eng & Contr 43:528-9 Je 16 '15
Railway and the automobile. T. C. Powell. Ry Age 59:804 O 29 '15
Transportation in the fair grounds; intramural railway, auto trains, rolling chairs and moving platform at the Panama-Pacific international exposition. il Elec Ry J 45: 754-5 Ap 17 '15
Transportation on land and sea: the growth

Transportation on land and sea; the growth of the railway and the steamship. il Sei Am 112:523-6+ Je 5 '15

See also Aeronautics; Automobiles; See also Aeronautics; Automobiles; Commerce; Demurrage; Electric railroads; Express companies; Ferryboats; Freight car service; Freight handling; Haulage; Jitney buses; Mine haulage; Motor trucks; Motor vehicles: Pneumatic tubes; Ports; Railroads; River traffic; Shipping; Steamboats; Street railroads; Telpherage; Terminals; Trucks; Vehicles; Waterways Street railroads; Telpherage Trucks; Vehicles; Waterways

Transportation, Military
General locomotive. Sci Am 112:212 Mr 6 '15
Mechanical traction in war. Sci Am S 78:407 D 26 '14

Sie also Automobiles in war; Hospital trains; Motor trucks, Military; Motorcycles in war; Railroads in war

Transportation and car accounting officers, Association of. See Association of transportation and car accounting officers

Transportation exhibits. See Railroads-Exhibitions

Transvaal

See also Gold mines and mining-Transvaal

Transylvania (steamship)
Geared turbine Atlantic liner. plan (p. 435)
Engineer 118:433 N 6 '14; Same cond. Eng M
48:605-6 Ja '15

Traveling engineers' association
23d annual convention, Chicago, Sept. 7-10. Ry
Age 59:473-4, 505-13 S 10-17 '15
23d annual convention, Chicago, Sept. 7-10.
Ry Age (Mech ed) 89:499-510 O '15
23d annual convention, Chicago, Sept. 7-10. Ry
R 57:337-41, 360-2 S 11-18 '15

Traverse tables

raverse tables
Aids: to traverse computations. H. Andrews.
Eng N 74:940-1 N 11 '15
Computation of survey traverses. H. Andrews.
Eng N 74:288-9 Ag 5 '15
Do surveyors use traverse tables? Eng N 73:
1038-9 My 27 '15
More about traverse tables and survey computations. E. E. Thum. Eng N 74:124-5 Jl 15
'15

Tree planting Fall planting. J. J. Levison. il Am For 21:861-5 Ag '15

Ag '15 How to plant a shade tree and how to care for it the first few years, J. J. Levison, il diags Am For 21:992-6 O '15

Tree planting Continued

Planting time and care of trees, S. B. Detwiler, Am For 21:100-2 F '15

Selecting trees and shrubs. Am For 21:591-3

SAP 1.5 Successful example of tree planting, A. S. Baldwin, il Ry Age 58:856 Ap 16 '15 320 miles of shade trees in Massachusetts, Am For 21:729 Je '15 Tree planting along the Lincoln highway, G. R. Nevitt, Am For 21:928-9 S '15

See also Forest planting

Tree surgery. See Trees, Care of

Tree toads

Park amphibians at the New York zoological park, R. L. Ditmars, il Sci Am S 80:196 S 25

Trees

rees
American trees in German forests. J. S. Illick. il Am For 21:922-7 S '15
Artificial production of vigorous trees. Sci Am S 79:150 Mr 6 '15
Baltimore ordinance governing city forester. Munic Eng 48:274-5 Ap '15
Bermuda's little trees. W. R. Brown. il Am For 21:186-97 Mr '15
California tree novelties. E. A. Sterling. il Am For 21:768-78, 853-60 Jl-Ag '15
Cannon ball tree of tropical America. il Sci Am S 79:92 F 6 '15
Chinese trees do well here. il Am For 21:564-6

Chinese trees do well here. il Am For 21:564-6 Ap '15 Ap

Ap '15
Effect of tarred roads upon trees. Sci Am 112:344 Ap 10 '15
Flushing's oldest tree. E. P. Martin. il Am For 21:614-15 My '15
Hardwoods on the country estate. W. H. Miller. il Am For 21:780-91 Jl '15
How a tree grows. B. Adams. Am For 21:935-6 S '15

S '15
Ornamental and shade trees. J. J. Levison. See-monthly numbers of American forestry Selecting shade trees, S. B. Detwiler. Am For 21:18-21 Ja '15
Sprout growth of trees. B. Adams. il Am For 21:1059-61 N '15
Tree fruits and flowers. W. H. Miller, il Am For 21:617-25 My '15

Sec also Forests and forestry; Lumber; Timber; Tree planting; Woodlots; also names of trees, e. g. Chestnut, Cypress, Fir, Hemlock, Juniper, Pine, Tulip tree

Diseases and pests

Ornamental and shade trees, J. J. Levison. Am For 21:797-801 Jl '15

Trees, Care of
How to plant a shade tree and how to care
for it the first few years. J. J. Levison. il
dlags Am For 21:992-6 O '15

Planting time and care of trees. S. B. Detwiler. Am For 21:100-2 F '15

Taking the crook out of a tree. H. D. Lip-pincott; T: B. Meehan. Am For 21:1063-4 N

## Cost

Cost of caring for trees in Newark, N. J. Eng & Contr 43:88 Ja 27 '15

Trenches

Adapted machinery and construction methods employed on new Western avenue sewer, Chicago—time studies. S. E. Bates. il diag Eng & Contr 44:283-5 O 13 '15

Backfilling wagons, truck and shovel make record on sewer job. il Eng Rec 72:521 O 23

Cheap and effective backfilling with a road roller. B. A. Heinly. il Eng N 73:941 My 13 '15

Cost of trench work through brick pavement for wire conduit, F. L. Shidler, Eng & Contr 43:504 Je 2'15

Digging and filling trenches by machine, il Sci Am 111:512 D 19 '14

Excavating and backfilling sewer trenches by machine. Eng Rec 71:20-1 Ja 2 '15

Excavating and timbering the very deep trenches required in reservoir and other dam construction. J. M. M. Greig. plans Eng & Contr 44:176-8 S 8 '15

General utility trench filler, il Munic Eng 49: 85-6 Ag '15; Munic J 39:414 S 9 '15 New trenching machines, il Eng N 74:448-9 S 2

Power scraper for backfilling trenches, il Eng & Contr 44:215-16 S 15 '15 Steam shovel digs 48-inch pipe trench in busy street, F: H. Pond, il Eng Rec 71:693-4 My 29 '15

Track-trench excavating machine, il Elec Ry J 46:74 Jl 10 '15

Trenches, Military. See Intrenchments

Trent agitators

Slime agitation and solution replacement methods at the West End mill, Tonopah, Nev. J. A. Carpenter, diag Am Inst Min E Bul 104:1639-51 Ag '15; Same. Met & Chem Eng 13:671-6 O 1 '15

Trent river

Improvement of the river Trent, map Engineer 119:130-1 F 5 715

Trenton, New Jersey

### Streets

Trenton's 1914 paving work. H. F. Harris. il Munic J 38:279-80 Mr 4 '15

Trephining
Prehistoric man and his early efforts to combat disease. T. W. Parry, il Sci Am S 78:365-6, 1): 5-14

Trestles

restles
Design, construction, operation and cost of a
2,594-ft. steel stocking trestle at the Negaunee mine, Negaunee, Mich. S. R. Elliott. il
Eng & Contr 44:171-3 S 1 '15
Permanent stockpile trestle of wood. O. Gustafson, il diags Eng & Min J 98:1003-4 D 5 '14
Pile and timber trestle bridges. Ry Age 59:
754-6 O 22 '15
Piledriver with traversing leads for driving
trestle bents. il diags Eng N 73:28-9 Ja 7
'15

Record reconstruction at Galveston. il Elec Ry J 46:867 O 23'15 Renewing trestle stringers without delay to traffic. S. C. Tanner. il diag Ry Age 59: 348 Ag 20'15

o+8 Ag 20 10 Trestle building with easily moved pile driver. G: A. Eaton. il Eng Rec 71:501 Ap 17 '15 Virgin country renders concrete pipe line con-struction difficult. B. Ehle. il diags Eng Rec 72:507-10 O 23 '15

See also Bridges

Nee also Bridges

Trestles, Concrete
Concrete trestles on Tennessee division second track, Illinois Central R. R. M. Johnson. il Ry R 56:715-18 My 29 '15
Design of standard solid-deck reinforced concrete trestle in use on Illinois Central railroad. Eng & Contr 44:287-9 0 13 '15
Reinforced-concrete highway trestle. S. M. Cotten. diags Eng Rec 71:54 Ja 9 '15
Solid deck trestles and bridges on the Illinois Central, il diags Ry Age 59:279-80 Ag 13 '15
Unit-construction system applied to a threemile concrete viaduct to reduce the cost. il diags plan Eng Rec 72:248-51 Ag 28 '15

Trinitrotoluene

Trinitrotoluene Trinitrotoluene in the war. Sci Am S 79:171 Mr 13 '15

Trinity river, Texas
Levee construction on Trinity river. O.
Finley. Eng & Contr 44:sup29-30 O 6 '15

Methods and cost survey of Trinity river, Texas. T. H. Jackson. Eng & Contr 44:271-3. O 6'15

Trioxymethylene

Action of trioxymethylene on p-xylene in the presence of aluminum chloride, R. C. Huston and D. T. Ewing. Am Chem Soc J 37: 2394-9, 2401 O '15

Action of trioxymethylene on the various hydrocarbons in the presence of aluminum chloride. G. B. Frankforter and V. Kokatnur. Am Chem Soc J 37:2399-401 O '15

Triphenylmethane

Temperature coefficients and the effects of acids, bases and salts in reaction velocities of the triphenylmethane dyes. H. C. Biddle and C. W. Porter. Am Chem Soc J 37:1571-89 Je '15

Triphenylmethyl

riphenylmethyl; preparation of p-hydroxy-triphenylmethyl; preparation of p-hydroxy-triphenylcarbinol and attempts to isolate the corresponding triarylmethyl. M. Gom-berg and R. J. Jickling. Am Chem Soc J 37: 2575-91 N '15 Triphenylmethyl; the additive compounds of triphenylmethyl and some saturated hydro-carbons. M. Gomberg and C. S. Schoepfle. Am Chem Soc J 37:2569-74 N '15

Trisection of angles

Trisecting an angle mechanically. Sci Am 113: 271 S 25 '15

Trolley lines. See Electric railroads

Trolley poles. See Poles, Concrete

Trolley wheels. See Electric railroads—Equipment and supplies

Trolley wire
A. S. T. M. specifications for trolley wire. Elec
Ry J 46:62-3 J1 10 '15

See also Electric railroads-Wiring

Trolley-wire splicer

Balanced trolley-wire splicer, diag Elec Ry J 46:919 O 30 '15

Trolleys

Electric crane trolley, il Ry Age 58:708 Mr 26

See also Electric railroads-Equipment

Troy, New York

Bridges

Center bearing, machinery and gates, Congress street swingbridge, diags plan Eng N 73:804-5 Ap 29 '15
Congress street bridge across the Hudson river at Troy; structural features. H: W. Hodge, diags Eng N 73:574-5 Mr 25 '15

Troy, Pennsylvania

Sewerage

Privately financed system of sewers. H: W. Taylor. Eng Rec 71:79-80 Ja 16 '15

Trucks

Methods of handling L. C. L. outbound freight, E. H. Lee. Ry Age 57:1181-4 D 25 '14 New type of factory lift truck, il Iron Age 96: 363 Ag 12 '15

Nee also Car trucks; Electric trucks; Motor trucks

russes
Design and construction of roof and wall
trusses, M. A. Howe, diags Brickb 24:55-8,
89-92, 119-24, 133-6, 175-8 Mr-JI '15
Design of beams, girders and trusses. E. McCullough, diags Bldg Age 36:27-8 JI; 33-4
Ag; 29-30 S; 37-9 N; 27-9 D '14; 37:
39-41 Ja; 31-3 F; 27-8 Mr; 49-50 Ap; 49-50
My; 47-8 Je; 45-6 JI; 27-8 Ag; 29-30 S; 37-8
N; 51-2 D '15

Eccentric heel joint of roof truss; solution of problem. E: H. Rockwell. Eng N 74:796-8 O 21 '15

21 '15 Erecting new trusses on a canal bridge and dam. W. R. Browne, il diags Eng N 74:173-4 Jl 22 '15 Gusset-plate diagram. W. M. Eliot. Eng N 73:940 My 13 '15 Heavy trusses and foundation girders used in steel bank building, diags Eng Rec 71:713-14 Le 5 '15

High stresses carried by heavy riveted truss, il diags Eng Rec 72:159 Ag 7 '15

Moments at eccentric heel-joint of roof truss. C: W. Chassaing. Eng N 73:000 My 20 '15

Moments at eccentric heel-joint of roof truss. E: Godfrey. Eng N 74:399 Ag 26 '15

Problem in truss design. Eng N 73:592 Mr 25

e construction of church roof trusses. McCullough, diags Bldg Age 37:59-61 Ja Safe

Stresses in a rigid frame of two columns and a truss; with table. F. Freyhold, Eng N 73: 1031-3 My 27 '15

Bridges; Building; See also Strains and stresses

Trust companies

See also Railroads-Equipment trusts

Trusts, Industrial
Full text of decision in the United States district court for the district of New Jersey.
Iron Tr R 56:1171-1218 Je 10 '15
German cartel policy. O: H. Luken. Eng M 48:

508-16 Ja '15

Government co-operation with our industries. Sci Am 112:99 Ja 30 '15 United States steel corporation wins its suit. Iron Age 95:1299-1301+ Je 10 '15

Sec also Clayton act; Public service cor-porations—Regulation

Trypsin

Comparison of methods for the determination of the proteolytic activity of pancreas preparations, J. H. Long and A. W. Barton. Am Chem Soc J 36:2151-66 O '14

Chem Soc J 36:2151-66 O '14

Tube milling
Tube-mill tonnage calculation. N. Cunningham. Met & Chem Eng 13:22, 138 Ja, Mr '15
Tube-milling: closed circuit. W. J. Pentland.
Met & Chem Eng 13:826-7 N 15 '15

Tube-milling for the flotation or oil-concentration process. W. B. Easton. Met & Chem
Eng 13:89-90 F '15

Tube-milling in all-slime cyanide practice.
W. J. Pentland. Met & Chem Eng 12:750-3;
13:204-5 D '14, Ap '15
Tube-milling tonnage calculation and notes
on tube-milling. H. B. Lowden; A. H. Jones.
Met & Chem Eng 13:70-2 F '15
Tube-milling tonnage calculation and notes on

Tube-milling tonnage calculation and notes on tube-milling. J. H. Haynes. Met & Chem Eng 13:10-12 Ja '15

See also Gold milling; Ore treatment

Tube mills

British Portland cement making machinery; shells for ball and tube mills. il Engineer 120: 195-6 Ag 27 '15

Injector for tube-mill feed. N. Carless. diag Met & Chem Eng 13:389 Je '15

Manganese-steel castings in the mining industry. W. S. McKee, il diag Am Inst Min E Bul 108:2402-6 D '15; Same. Iron Tr R 57: 1079-80 D 2 '15

Scoon discharges for tube-mills. W. R. Dowl-

Scoop discharges for tube-mills. W. R. Dowling. Met & Chem Eng 13:874 N 15 '15
Tube-mill end liners. J. F. Pyles. Met & Chem Eng 12:784-5 D '14

Sec also Crushing machinery; Hardinge mill

Tuberculosis

Artificial light treatment of surgical tuberculosis. Sci Am S 80:175-6 S 11 '15

Cost of health-seeking. Sci Am 112:78 Ja 23 '15 Phthisis conditions on the Rand. A. C. Key. Eng & Min J 99:28-9 Ja 2 '15

Pulmonary disease among miners in the Jop-lin district, Missouri and its relation to rock dust in the mines. A. J. Lanza and E. Hig-gins. il maps U S Bur Mines Tech Pa 105:1-47 '15; Abstract. Eng & Min J 99:331-3 F 13

Tuberculosis, Hospitals and sanatoriums for Chicago municipal tuberculosis sanitarium. C. A. Erikson, il plans Brickb 24:267-72, pl 151-7 N 15

Cook county tuberculosis colony at Oak Forest, Ill. C. A. Erikson. il plans Brickb 24:273-6, pl 158-60 N '15

Drawing metal tubes of special section. C. L. Lucas. il diag Mach 21:457-9 F '15

Drawing smaller sizes of brass tubing, il Iron Age 95:661-3 Mr 25 '15

Seamless drawn steel tubes. Power 42:121 Jl

Simple physical tests for condenser tubes. H: A. Cozzens, jr. il Elec W 66:642 S 18 '15 Small aluminum tubes, J. P. Sheehy, il diags Metal Ind n s 13:55-6 F '15

Tube forming die. A. H. Wilson, diags Mach 21:666-7 Ap '15

Wrought iron and steel tubes. J. G. Stewart. Power 41:523-4 Ap 13 '15 See also Pipes

Tubes, Boiler. See Boiler tubes Tubular bridges. See Bridges, Tubular Tucson, Arizona

Lighting

Tucson's ornamental street-lighting system. il Elec R & W Elec'n 66:962-3 My 22 '15

Characteristics and seeding of the tulip tree. S. B. Elliott, il Am For 21:840-4 Ag '15 Tulip or yellow poplar tree. il Am For 21:833-40 Ag '15

Tumbling barrels

Traveling mill for cleaning scrap. il plan Iron Age 96:14-15 Jl 1 '15 Tumbling barrel ("Jim Butler") work, T. C. Eichstaedt, Metal Ind n s 13:368-9 S '15 Tungsten

Burmese tungsten. E. Maxwell-Lefroy. Engineer 120:320-1 O 1 '15
Effect of chromium and tungsten upon the hardening and tempering of high speed tool steel; abstract with discussion. C. A. Edwards and H. Kikkawa. Iron Age 96:1126-7 N 11 '15

M 11 15
Melting-point of tungsten. I. Langmuir. J Fr
Inst 180:490-2 O '15
Production of tungsten and molybdenum in
England. J Ind & Eng Chem 7:719 Ag '15
Separation of tungsten from molybdenum.
E: E. Marbaker. Am Chem Soc J 37:86-95
Ja '15

Tungsten in the British empire. Eng & Min J 100:50-1 Jl 10 '15 Tungsten ores in 1914. Eng & Min J 99:229-30

Ja 30 '15
Tungsten—the hardener. J. E: Schipper. il
Automobile 32:351-4 F 25 '15

Tungsten lamps. See Electric lamps, Tungsten

Funnel design

Unnel design

Arched reinforced-concrete conduits designed by the theory of least work. W. M. Smith. Eng Rec 71:648-52 My 22 '15

Building a sewer tunnel of special concrete blocks reinforced. A. J. Latornell. diags Eng N 74:127-8 Jl 15 '15

Construction of water works tunnels in the Metropolitan water district of Massachusetts. W; E. Foss. il diags Eng & Contruction of the Contruction of t

unnel fires Tunnel destroyed by fire on the Southern Pacific, il Ry Age 59:115-16 Jl 16 '15

Funnel lining

unnel lining
Belt conveyors will help simultaneous driving
and lining of air tunnel. G. D. Emerson. il
diags map Eng Rec 72:218-19 Ag 21 '15
City tunnel of the Catskill aqueduct. W. E.
Spear. Eng N 73:194-9 F 4 '15
Construction plant and methods employed in
building a system of concrete block tunnel
sewers at Edmonton, Alberta. diags Eng &
Contr 43:361-3 Ap 21 '15
Determination of stresses in and design of cast
iron lining for subaqueous tunnels. P. A. N.
Seurot. diags Eng & Contr 43:90-2 F 3 '15
Large telescopic steel form for tunnel lining.
il Eng & Contr 44:152 Ag 25 '15
Light steel lining plates as a substitute for
timbering in tunneling. il Eng & Contr 44:
97 Ag 4 '15
Lining a double track railway tunnel under

timbering in tunneling, if Eng & Contr 44: 97 Ag 4 '15
Lining a double track railway tunnel under traffic, R. Meacham, il diag Ry Age 59:966-8
N 19 '15; Same, Ry R 57:645-8 N 20 '15;
Same, Eng & Contr 44:395-6 N 17 '15
Lining a railway tunnel by compressed air, il
Eng N 74:1033 N 25 '15
Lining the Snoqualmie tunnel, diag Ry Age 58:
152 Ja 22 '15

Lining tunnels on the new Lewistown-Great Falls line of the St. Paul. diag Ry Age 58: 978-9 My 7 '15 Lining two 5-ft. tunnels by use of concrete atomizer. il Eng N 74:938-9 N 11 '15 Molding and casting large tunnel segments. L: J. Josten. il diags Foundry 43:356-9 S '15

Molding cast-iron tunnel linings. L: J. Josten. il Iron Age 95:715-19 Ap 1 '15

New intake tower and tunnel at the St. Louis water works, E: C. Davis, il Assn Eng Soc J 53:287-93 D '14; Excerpt (Lining the St. Louis water tunnel). Eng N 73:164-6 Ja 28 '15

Placing a concrete lining in the Sandy Ridge tunnel, il plan Ry Age 59:533-6 S 17 '15; Same. Ry R 57:327-32 S 11 '15; Same (Self-propelled compressed-air mixing plant) Eng Rec 72:353-5 S 18 '15
Pneumatic outfit delivers concrete 1300 feet to tunnel forms, il Eng Rec 71:246 F 20 '15
Records of operation in handling concrete with compressed air, il diag Concrete Cem 5: 260-3 D '14

Tunnel lining by compressed air, il Ry Age 57: 1143-4 D 18 '14
Tunnel waterproofing with cement-and-clay mortar, Eng N 73:731-2 Ap 15 '15

Tunnel shields

Collapsed tunnel shield at Memphis rebuilt in bad ground. C. H. Hollingsworth. il diags Eng Rec 71:388-9 Mr 27 '15 East river tunnel, shields. il diags Eng N 74: 952-5 N 11 '15

Roof shield used for driving railroad tunnel in soft earth, il diags Eng Rec 71:272-3 F 27 '15; Same cond. Eng M 49:280-1 My '15

Tunnel ventilation

Ventilating the Stampede tunnel of the North-ern Pacific, il diags Ry Age 59:234-5 Ag 6

Ventilation of Allegheny Summit tunnel: successful installation of Virginian railway at one portal of a 5176-ft. bore for the most part of a 1.22-per cent grade. F. F. Harrington, il diags Eng Rec 70:324-5 S 19 '14; Same. Gen Elec R 17:1182-5 D '14; Same. Ry R 55:741-3 D 19 '14

See also Subways-Ventilation

Tunneling. See Tunnels and tunneling

Tunneling. See Tunnels and tunneling
Tunnels and tunneling
Absolute dependability of central-station
power. il Elec W 65:1255-6 My 13 '15
Belt conveyors will help simultaneous driving
and lining of air tunnel. G. D. Emerson. il
diags map Eng Rec 72:218-19 Ag 21 '15
Bottom heading successful at Snoqualmie tunnel. diags Eng Rec 71:193 F 13 '15
Building invert of Milwaukee intake tunnel.
L. G. Warren. diags Eng N 74:892-3 N 4 '15
Calculations showing economy of constructing
the Rogers Pass tunnel. J. G. Sullivan. diags
Eng & Contr 44:398-400 N 17 '15
Canvas air duct in tunneling. Eng N 74:177-8
J1 22 '15
Catskill aqueduct tunneling. il diag Munic J

JI 22 '15
Catskill aqueduct tunneling, il diag Munic J
38:728-9 My 27 '15
City tunnel of the Catskill aqueduct. W. E.
Spear, diags plan Eng N 73:56-60, 98-103,
148-53, 194-9 Ja 14-F 4 '15; Excerpt. Eng M
48:898-900 Mr '15

148-93, 194-9 Ja 14-F 4 '15; Excerpt. Eng M 48:898-900 Mr '15
Collapsed tunnel shield at Memphis rebuilt in bad ground. C. H. Hollingsworth. il diags Eng Rec 71:388-9 Mr 27 '15
Completing the Mount Royal tunnel into Montreal. il diags plan Ry Age 59:857-60 N 5 '15
Completion of a long tunnel in France. Eng N 74:91-2 Jl 8 '15
Constructing rock tunnel of 50-ft. clear width, Stockton st., San Francisco. E. G. Tilton. il diags plan Eng & Contr 43:93-6 F 3 '15
Construction features on the Passaic valley sewer. il diags Munic J 38:59-62 Ja 21 '15
Construction of Mile Rock tunnel, San Francisco. il Munic Eng 48:211-13 Mr '15
Construction plant and methods employed on new water works intake tunnel at Milwaukee. il diags plan Eng & Contr 43:352-5, 371-2 Ap 21-28 '15
Construction progress on the Twin Peaks tunnel. A. J. Cleary. il diags Eng N '74:869-71 N 4 '15
Construction work on Twin Peaks tunnel, San

Construction work on Twin Peaks tunnel, San Francisco, il Eng N 73:1037 My 27 '15 Contractor's methods and plant at the Kennerdell tunnel of the Pennsylvania R. R. Eng N 73:835-6 Ap 1 '15 Deep tunnel completed in unsound rock solidified by extraordinary grouting. il Eng Rec 72:417-19 O 2 '15 Details of record tunneling at Rogers' Pass. Eng Rec 71:27-8 Ja 2 '15 Driving a five-mile tunnel through the Selairs in diags map Ry Age 57:1082-4 D 11 '14 Driving and lining carried on simultaneously

Driving and lining carried on simultaneously at Snoqualmie tunnel saved timbering, R. W. Rae. diags Eng Rec 72:44-6 Jl 10 '15

Tunnels and tunneling—Continued

Driving the Sheep Creek tunnel, diags Eng &
Min J 98:693-8 O 17 '14; Same cond. Eng &
Contr 43:152-4 F 17 '15
Driving the tunnel for the Marseilles-Rhone
canal. R: F. Wagner, diag Eng N 74:803-4 O

Earth tunnel for pipe sewer at Virginia, Minn. il Eng N 73:351 F 18 '15 Economic comparison of European and American methods of driving tunnel heading. E. Lauchli. diags Eng & Contr 44:411-13 N 24

Grouting equipment for city tunnel, Catskill aqueduct. W. E. Spear. diags Eng N 73:

Grouting equipment for city tunnel, Catskill aqueduct. W. E. Spear. diags Eng N 73: \$24 My 6 15
Important realinement problem on the Pennsylvania. il map Ry Age 59:456-8 S 10 '15
Largest tunnel in the world. E. L. Corthell. diags map ling N 74:386-7 Ag 26 '15: Abstract. Eng & Min J 100:800 N 13 '15
Methods and instruments used in making precise surface and underground for the Canadian Northern Ry. tunnel, Montreal, Canada. J. L. Busfield. il diags plan Eng & Contr 42:383-6 O 21 '14
Methods used in building the Rogers Pass tunnel, diags Eng N 74:920-3 N 11 '15; Except. Eng & Min J 100:957-8 D 11 '15
Mile-long highway tunnel in Pittsburgh, Penn. diags Eng N 74:300 Ag 12 '15
Modern methods in railway tunnel construction, C: S. Churchill, diags Ry R 57:547-55
New American tunneling record at Rogers'

tion. C: S. Churchill, diags Ry R 57:547-55 O 30 '15

New American tunneling record at Rogers' Pass. Eng Rec 70:659 D 19 '14

New methods of pneumatic tunneling aid safe and rapid completion of Passaic valley sewer contract. il diags Eng Rec 71:130-3 Ja 30 '15

New York rapid transit railway extensions. F. Lavis. il diags Eng N 72:1206-10 D 17 '14

New York subway tapped for new connections while carrying heavy traffic, il diags plan Eng Rec 72:255-7 Ag 28 '15

Opening of the Mont d'Or tunnel, il map Engineer 119:505-6, 508 My 21. '15

Piercing the Selkirk mountains for a five-mile tunnel, il map Enge Rec 70:604-6 D 5 '14; Same cond. Eng M 48:760-2 F '15

Primer on explosives for metal miners and quarrymen. C: E. Munroe and C. Hall, diags pl U S Bur Mines Bul 80:72-93 '15

Progress on Summit cut-off of the Lackawanna, il diags Ry Age 58:238-9 F 5 '15

Railroad building under and over the streets of New York, il map Sci Am 113:96-7+ Jl 31 '15

Rapid tunnel driving under the bonus system.

of New York, il map Sci Am 113:96-7+ Jl 31 '15
Rapid tunnel driving under the bonus system.
J. R. McFarland, Eng N 74:405-6 Ag 26 '15;
Same. Eng & Min J 100:517-18 S 25 '15
Roof shield used for driving railroad tunnel in soft earth, Point Defiance, Tacoma, il diags Eng Rec 71:272-3 F 27 '15; Same cond. Eng M 49:280-1 My '15
Roosevelt drainage tunnel, Cripple Creek, Colorado. T. H. Sheldon, il map Eng & Min J 100:545-9 O 2 '15
Rove tunnel on the canal from Marseilles to the Rhone. Bourgougnon, diags Eng & Contr 43:536-7 Je 16 '15; Abstract (Largest tunnel in the world) Eng M 49:759 Ag '15
Sewer tunnel in clay driven with simple equipment in eight weeks. Eng Rec 71:181 F 6 '15
Snoqualmie tunnel; C., M. & St. P. Ry. diags Eng N 73:346-9 F 18 '15
Special features in the new intake tunnel at Milwaukee, Wis, L. G. Warren, diags Eng N 73:350-7 Ap 8 '15.
Speed of tunnel timbering increased by using erection outlookers, diags Eng N 73:543 Mr 18 '15

18 '15 Stockton street tunnel and Twin Peaks tunnel in San Francisco. A. J. Cleary, il map Eng N 73:314-17 F 18 '15 Tunnel driven under inclined railway with thin earth cover. R. A. Riley, il diags Eng Rec 72:365-6 S 18 '15

Tunnel driving record on Passaic valley sewer. Munic J 38:506 Ap 15 '15

Tunnel, 400 feet below existing bore, replaces short section of damaged Catskill siphon. il diags Eng Rec 71:514-16 Ap 24 '15 Tunnel streets at San Francisco, T. A. Church. Munic J 38:767-8 Je 3 '15

Two-mile street railway tunnel at San Francisco, Eng Rec 71:47-8 Ja 9 '15 Will pioneer bore weaken Rogers Pass tunnel? E. Lauchli, Eng Rec 71:308 Mr 6 '15

See also Blasting; Excavation; Mining engineering; Subways; Tunnel design; Tunnel lining; Tunnel shields; Tunnel ventilation

Inning; Tunnel shields; Tunnel ventilation

Tunnels and tunnelling, Subaqueous
Astoria-Bronx gas tunnel. J. F. Springer. il
Munic J 39:649-50 O 28 '15
Astoria tunnel under the East river for gas
distribution in New York city. J: V. Davies.
il map Am Gas Light J 103:225-30, 244-7+
O 11-18 '15
Chelsea Creek tunnel for Boston water main.
W. B. Conant. il diags Munic J 38:387-90 Mr
25 '15

W. B. Conant. il diags Munic J 38:387-90 Mr 25 '15
Cleveland west side water-supply tunnel. il diags plan Eng N 73:4-8 Ja 7 '15
Construction of water works tunnels in the Metropolitan water district of Massachusetts. W: E. Foss. il diags map Eng & Contr 42:84-9, 129-31, 352-5, 451-3 Jl 22, Ag 5, O 14, N 11 '14
Detail and fabrication of Harlem river tubes. T: Duckworth. il diags Eng Soc W Pa 31: 538-60; Discussion. 31:560-83 O '15
Determination of stresses in and design of cast iron lining for subaqueous tunnels. P. A. N. Seurot. diags Eng & Contr 43:90-2 F 3 '15
East river tunnel shields. il diags Eng N 74: 952-5 N 11 '15
Economic value of the Detroit river tunnel. Sci Am 113:422 N 13 '15
Flooding and recovery of the Astoria tunnel. H. Carpenter. il diags Eng N 74:673-8, '736-410 O '14' 15
Great gas tunnel under the East river. J. F. Springer. il Sci Am 113:380-1 O 30 '15
Harlem river four-track subway tunnel. O Hoff. il diags map Eng Soc W Pa 31:517-37
Discussion. 31:571-83 O '15
Important terminal improvement; Detroi river tunnel; il Sci Am S 80:398 N 13 '15
Laying a 6-ft. pipe tunnel across the Milwaukee river. il diags Eng N 72:1250-4 Mr 18 '15
New York rapid transit railway extensions F. Lavis, il diags Eng N 72:1250-4 D 24 '1', New York tunnel power plants, il plans Eng N 74:700-1 O 7 '15
Piledriving destroys a tunnel by clay pressure il Eng N 74:404-5 Ag 26 '15

74:700-1 O 7'15
Piledriving destroys a tunnel by clay pressure il Eng N 74:404-5 Ag 26'15
Seventy years of civil engineering. il Sci An 112:529+ Je 5'15
Starting six tubes for two new East river sub way crossings in New York. il diags Eng Re 71:810-12 Je 26'15
Water-pipe tunnel, Metropolitan water-works B. Lawrence. il diags Eng N 73:1116-21 J 10'15

Turbines

Design of scroll cases and intakes for single runner turbines analyzed. A. G. Hillberg diags Eng Rec 72:413-15, 442-4 O 2-9 '15 Design of turbine draft tubes analyzed. A. C. Hillberg. Eng Rec 72:604-7, 630-1 N 13-20 '1 Developments in modern water turbine practice. H. Zoelly. il diags Power 42:698-702 : 16 '15

16 '15 Hydraulic turbines for Great Falls power company, il Eng Rec 71:183 Je 5 '15 Hydraulic turbines; wheels and pumps at the Fanama-Pacific exposition, H. J. Kennedy, Sci Am S 80:124-6 Ag 21 '15 Improved hydraulic governor, il Eng Rec 7 383-4 Mr 20 '15 Largest hydraulic motor, il Sci Am 113:153 Ag 1'15

21 '15
One governor controls two waterwheels.
Eng Rec 71:372-3 Mr 20 '15
Pelton turbines and their governors: abstrac
F. Präsil. diags Am Soc M E J 37:44-5, 11'
15 Ja-F '15

en per cent efficiency increase follo change from double to single-runner to bine. il diags Eng Rec 71:365-7 Mr 20 '15

Turbines of the Cedars (Quebec) hydro-electric plant, il diag Eng N 73:611-13 Ap 1 '.

Water turbine characteristics. G: H. Bancrof Eng Rec 71:45-7 Ja 9 '15

Water turbines on the Borgne river plan abstract. F. Prásil. diag Am Soc M E J 3 44-5 Ja '15

Turbines -- Continued

Wicket gates the logical development for hydraulic turbine regulation. L: F. Moody, diags Eng Rec 72:358-60 S 18 '15 World's largest low-head turbines in operation; Cedars Rapids development, il Eng Rec 71:154 Ja 30 '15

See also Gas turbines; Steam turbines; Water wheels

Testing

Arrangements for conducting tests on water turbines when installed, diags Elec W 66:253-4 Jl 31 '15 Cylinder gates increase turbine efficiency; Holyoke tests. A. G. Hillberg. Eng Rec 71: 485 Ap 17 '15 Diaphragm method for the measurement of water in open channels of uniform cross-sec-

water in open channels of uniform cross-section. C. R. Weidner, bibliog il Wis U Bul Eng S 8:1-72 no 1 '14; Excepts. Eng N 72: 532-4 S 10 '14; Eng & Contr 42:414-15 O 28

'14
Do cylinder gates increase turbine efficiency?
H. B. Taylor, Eng Rec 71:690-1 My 29 '15
Electrical methods of testing hydraulic turbines; abstract. A. Strickler, Am Soc M E J 27:285-6 My '15
Means suggested for interpretation of waterturbine test data. L. F. Harza, il Eng Rec 72:542-4 O 30 '15

r2:542-4 O 30 '15

New flume needed for waterwheel tests; canvass of opinions. Eng Rec 71:379 Mr 20 '15
Old wooden turbine tested. C. B. Stewart. il plan Eng N 74:687-8 O 7 '15

Proposed government testing flume for hydraulic turbines not needed. H. B. Taylor. Eng Rec 72:321-2 S 11 '15
Salt solution test shows turbine efficiency of 93 per cent at Holtwood plant. il diags Eng Rec 71:358-60 Mr 20 '15

Stream gaging by titration; comparative tests of new chemical and standard mechanical methods of gaging stream flow. diag plan Eng & Contr 42:270-3 S 16 '14
Tests of high-power high-speed water turbines. S. J. Zowski. Eng Rec 70:689-90 D 26 '14

Urbines. Gas. See Gos. turbines.

Turbines, Gas. See Gas turbines

Turbines, Steam. See Steam turbines

Turbo-blowers. See Blowing engines

Turbo-generator sets, Swiss, il diags Engineer 119:179-82, 204-6 F 19-26 '15

Turkey Engineering prospects in Turkey, Engineer 119:371-2, 395-6 Ap 16-23 '15

Army

Military resources of Turkey, il Sci Am 111: 458 D 5 '14

Industries and resources

Minerals of Asiatic Turkey, map Eng & Min J 100:715-17 O 30 '15

Navy

Military resources of Turkey. il Sci Am 111: 458-9+ D 5 '14

urning

urning
Adjustable and multi-cutting turning tools.
F. H. Mayoh. diags Mach 21:302-3 D '14
Amalgamated machinery corporation turning
machine for rapid work. il Iron Tr R 57:895

Machine for rough turning shell blanks. il Iron Age 95:1402 Je 24 '15 Special turning machine. il Iron Tr R 57:32 Jl 1 '15

Turning engine bolts. C. L. Dickert, il diags Ry Age (Mech ed) 89:193-4 Ap '15 See also Lathes

Turntables

Ball-bearing turntable with latch, diags Eng & Min J 99:577-8 Mr 27 '15

Improved turntable for contractor's dump cars. diag Eng N 73:988 My 20 '15 Turntable aids road contractor in solving haul-ing problem. il Eng Rec 72:303 S 4 '15

Turpentine Composition omposition of wood turpentine. M. Adams. J Ind & Eng Chem 7:957-60 N '15 Contributions of the chemist to the naval stores industry, J; E. Teeple, J Ind & Eng Chem 7:931-2 N '15 Naval stores industry, A, W. Schorger and H. S. Betts, diags 11 pls maps U S Agric Bul 229:1-58 '15

Tweed

Making of Scotch tweeds, T: Welsh. Textile World 48:398-400, 501-3 Ja-F '15

Twilight sleep

Twilight sleep in the light of day, Sci Am S 79:112 F 13 '15

Twine

& W Elec'n 67:551-4 S 25 '15 Finishing jute twine, diag Textile World 48: 431-2 Ja '15

Two-family houses. See Duplex houses

Appropriateness, J. L. Frazier, il Inland Ptr 55:209-12 My '15 Type-designs in imitation of engraved work, J. L. Frazier, Inland Ptr 55:353-4 Je '15

See also Printing; Typesetting

Typesetting

Correct spacing of body-matter. J. L. Frazier. Inland Ptr 55:355-8 Je '15 Use and misuse of special characters and let-ters. D. H. Howard. Inland Ptr 56:40-2 O '15 See also Advertisements; Printing

Job work

Contour. J. L. Frazier. Inland Ptr 56:209-12 N

Distribution of white space, J. L. Frazier, Inland Ptr 56:355-8 D '15

Proced arrangements. J. L. Frazier. Inland Ptr 54:805-7 Mr '15 Idea for the job. F: F. Turner. Inland Ptr 55: 465-7 J1 '15

Job composition. J. L. Frazier. See monthly numbers of Inland printer Lesson in spacing. J. L. Frazier. Inland Ptr 56:353-4 D '15

Make it readable. J. L. Frazier. Inland Ptr 56:69-70, 213-14 O-N '15

56:69-70, 213-14 O-N '15
Order of display, J. L. Frazier. Inland Ptr 54: 517-19 Ja '15
Points on paneling, J. L. Frazier. Inland Ptr 55:645-6 Ag '15
Running-head as an embellishment. J. L. Frazier. Inland Ptr 55:785-7 S '15
Styles of typography that have been discarded—and why. G. P. Farrar. il Inland Ptr 55: 616-20 Ag '15

Typesetting machines

Cost of machine composition. B. Daniels. Inland Ptr 54:549-50 Ja '15
Modern methods of composing type. il Sci Am S 80:321, 324-6 N 20 '15
One-man typesetting and composing machine. Inland Ptr 54:512 Ja '15

See also Linotype

Typewriters

Developing a typewriter, J. Dangerfield, Mach 21:579-80 Mr '15

Largest typewriter in the world. il Sci Am 112:202 F 27 '15

Seventy years of inventions. il Sci Am 112:512, 514 Je 5 '15

Typhoid fever
Artificial immunity against typhoid fever.
A. M. Jungmann, il Sci Am 113:184-5 Ag 28
'15

Biochemical and engineering aspects of sanitary water supply. G: W. Fuller. J Fr Inst 180:43-61 Jl '15

Effect of filtration and sterilization on typhoid fever in Philadelphia, F. D. West. Munic J 39:111-12 Jl 22 '15

Model of the typhus carrier, il Sci Am 112:497 My 29 '15

Relations between the water supply and ty-phoid fever in Washington, D. C. J: Gaub. Am Water Works Assn J 1:727-33 D '14

Typhoid carriers. Sci Am 112:428 My 8 '15 Water-borne typhoid fever epidemic at Healds-burg, Cal. W. A. Sawyer, Eng & Contr 44: 179-80 S 8 '15

Typhoid fever—Continucd.

Water borne typhoid in Sacramento, Cal.—interesting application of liquid chlorine. N. E. Williamson. Eng & Contr 44:314 O 20 '15 Water-supplies and health in Massachusetts. A. L. Gammage. Eng N 74:1077-9 D 2 '15 Water-supply and typhoid fever at Cumberland, Md. A. G. Fowler and M. J. Colton. il Eng N 73:969-70 My 20 '15

Typhus fever Germ of typhus fever. Sci Am 112;591 Je 12 '15 Typhus fever. Sci Am S 80:28 Jl 10 '15

Typography. See Printing

Tyrannosaurus

Tyrannosaurus, a cretaceous carnivorous dinosaur. B. Brown. il Sci Am 113:322-3 O 9

Researches on hydantoins; a new synthesis of o-tyrosine. T. B. Johnson and W. M. Scott. Am Chem Soc J 37:1846-56 Ag '15

Ultra-violet rays

Development of ultra-violet water disinfection. il diag Eng N 74:634-6 S 30 '15

Development of ultra-violet water disinfection. i diag Eng N 74:634-6 S 30 '15

Effect of ultra-violet rays on the eye. Sci Am 113:323 O 9 '15

Effect on the eye of ultra-violet light. W. E. Burge. il diags Elec W 65:912-14 Ap 10 '15; Abstract. Sci Am S 80:345 N 27 '15

Mode of action of ultra-violet radiation in injuring the refracting media of the eye. W. E. Burge. J Fr Inst 180:477-8 O '15

More mysteries of ultra-violet light. L. K. Hirshberg. Sci Am 112:312-13 Ap 3 '15

Production and application of ultra-violet rays, particularly for water purification. M. von Recklinghausen. il diags Assn Eng Soc J 54:101-9 Mr '15

Purification of water by the ultra-violet rays. M. von Recklinghausen. il diags Am Water Works Assn J 1:565-84 S '14; Same. Sci Am S 79:10-12 Ja 2 '15; Discussion. Am Water Works Assn J 1:585-8 S '14

Sterilization of water by ultra-violet rays of the mercury-vapor quartz lamp. M. von Recklinghausen. diags Am Inst E E Pro 33: 1049-62 Je '14; Same cond. Eng M 47:756-8 Ag '14; Abstract and discussion. Elec R & W Elec'n 65:33-4 Jl 4 '14; Discussion. Am Inst E E Pro 33:1906-12 D '14

Ultra-violet rays and their application for the sterilization of water. M. von Recklinghausen. il diags J Fr Inst 178:681-704 D '14

Ultra-violet rays from the oscillating spark. Elec R & W Elec'n 66:1055-6 Je 5 '15

Ultramicroscope. See Microscope and microscopy

Ultramicroscope. See Microscope and microscopy Ultraudion. See Audion

Una-flow engines. See Steam engines

Underfeed stokers. See Stokers, Mechanical

Underground roads. See Subways

Underground surveys

Method and cost of making a relocation survey of underground pipe lines. O. E. Carr. plans Eng & Contr 42:153-5 Ag 12 '14; Same cond. (Underground survey of Cincinnati). Eng Rec 71:38-40 Ja 9 '15

Underground utility galleries. See Subways (conduits)

Underpinning. See Shoring and underpinning

Underwear

Finishing knit underwear. Textile World 49: 449-50, 541-4; 50:103-4 Jl-Ag, O '15 Merchandising of hosiery and underwear. C. C. Parlin. Textile World 49:sup265+ My

Production and costs in an underwear mill. Textile World 49:358-9 Je '15 Standard sizes for two-piece underwear. Tex-tile World 48:610-11 Mr '15

See also Hosiery; Union suits

Unemployed

Dayton's effort at solving the problem of the unemployed. H. C. Wight. Munic Eng 48: 198-9 Mr '15

Economic relation between the supply of skilled and intelligent workmen and unemployment of the masses. T: N. Carver. Am Soc M E J 37:279-80 My '15
Irregular employment; cost and causes. H: S. Dennison. Am Soc M E J 37:280-1 My '15
Report on winter unemployment. J. P. Newell, E. G. Hopson and others. Assn Eng Soc J 54:258-74 Je '15
Unemployment in twelve cities in the United States. Ry R 57:599 N 6 '15
Unemployment on railroads. Ry Age 58:214-15
F 5 '15
Unemployment resulting from collected.

Unemployment resulting from railroad depression. Ry Age 58:31-2 Ja 1 '15

See also Labor exchanges

Unexploded shells. See Shells, Unexploded Unfair competition. See Competition, Unfair Unicycles

Gyroscopic, motor-driven unicycle. Sci Am 111: 490 D 12 '14

Uniflow engines. See Steam engines

Uniform boiler law society, American. See American uniform boiler law society

Union label

Union label unnecessary in municipal contracts. Am Ind 15:27 Ap '15

Union Pacific railroad

Statistics for 1914, map Ry Age 57:1169-71 D

Wireless telegraph and wireless telephone on the Union Pacific R. R. il Ry R 55:587-91 N 14 '14; Abstract. Eng M 48:585-8 Ja '15

Improved union suit. diags Textile World 48: 422-3; 49:273-4, 356-7 Ja, My-Je '15

United shoe machinery co.

Decision in the United shoe machinery case. Sci Am 112:322+ Ap 3 '15
Patents involved in shoe machinery decision. Elec W 65:825-6 Mr 27 '15

### United States

Agriculture, Department of

Agricultural instruction for the millions. Sci Am 113:461 N 27 '15

Army

Medical reserve corps United States army. Sci Am S 80:235 O 9 '15
Troops to guard the coast. T. Blodgett. Sci Am 112:309 Ap 3 '15
United States an undefended treasure land, il Sci Am 112:118-20, 158-9+, 178-9, 198-9+ F 6-27 '15

Var capacity of United States railway R. Grimshaw. Sci Am 112:417+ My 1 '15 railways.

See also United States—Defenses; United States—Militia

Board of mediation and conciliation

Annual report. Ry Age 58:192-4 Ja 29 '15 Work of the Board of mediation and concilia-tion. Ry Age 58:175 Ja 29 '15 Year's work of the Federal board of mediation and conciliation. Ry R 55:774 D 26 '14

Railroad crisis: a way out [a railroad depart-ment with a cabinet officer]. R. Morris. Ry Age 58:743-4 Ap 2 '15

## Census

Census bureau no inquisition. Iron Age 95:823 Ap 8

### Coast and geodetic survey

Address to graduating class, Stevens institute of technology, O: H. Tittmann. Stevens Ind 32:233-45 J1 '15
Coast and geodetic survey work in 1915. Eng N 73:983-9 My 20 '15
New ships needed for the Coast and geodetic survey. Int Marine Eng 20:2-3 Ja '15

### Commerce

merican opportunity for Russian business. D: L. Hough, map Iron Age 95:616-17 Mr 18 American

Balance of trade in chemicals between the United States and Germany in 1913. J Ind & Eng Chem 6:1034-5 D '14

United States—Commerce—Continued.

Business questions considered by the Chamber of commerce of the United States. Iron Age 95:354-5 F 11 '15

Foreign and domestic commerce and business generally. J. A. Farrell. Eng Soc W Pa 31: 223-8 Mr '15 below commerce. A H. Pald.

223-8 Mr '15
How Uncle Sam helps commerce A. H. Baldwin. Iron Tr R 55:1231-2 D 31 '14
Opportunity for the engineer in China, F. A. Foster. Am Soc M E J 37:646 N '15
Pan-American trade—Argentina. A. M. Boggs. maps Am Ind 16:20-3 O '15

President's message: extracts. Ry R 55:718-19

D 12 '14 Why optimism? G: O. Smith. Colliery 35:392 F '15

See also Chamber of commerce of the United States of America; Chemical industries; European war—Commercial and financial aspects; Export trade; Interstate commerce; Interstate commerce commission; Panama canal—Commercial aspects; Railroads—United States; Shipping; Tariff—United States; United States—Commercial policy; United States—Federal trade commission; United States—Industries and resources; Waterways Waterways

Commerce, Department of

Secretary Redfield and the textile industry. Textile World 48:286a-286c D '14

## Commercial policy

Aniline dye situation, I. F. Stone, Met & Chem Eng 13:663-71 O 1 '15 Existing obstacles to the extension of our trade with Central and South America, M, Coster, Elec W 65:1158-9 My 8 '15 For America first, Iron Tr R 56:21-30 Ja 7 '15

See also Tariff—United States; States—Federal trade commission

### Commission on industrial relations

Commission on industrial relations
Causes of industrial unrest: summary of the preliminary report. Am Ind 15:14 Ja '15
Commission on industrial relations sits in Washington. Ry R 56:616-18 My 8 '15
Daniel Guggenheim's testimony. Eng & Min J 99:245-7 Ja 30 '15
Federal commission on industrial relations. W. Drew. Am Ind 15:17-18 Je '15
Report. Ry Age 59:433 S 3 '15
Report. W. Drew. Am Ind 15:15-17 Ja '15
Report of progress. Iron 'Tr R 55:1100-1 D 10 '14

## Congress

Rural control of Congress. J. A. Emery. Am Ind 15:14-15 F '15

## Defenses

Actual and theoretical ranges of the United States coast defense guns. Sci Am 112:472 My 22 '15

Coming program for army and navy. Iron Age 96:578-9 S 9 '15

96:578-9 S 9 '15 Country's railroads and national defense; with discussion. G: D. Snyder. Ry Age 59:1017-18 N 26 '15; Abstract. Ry R 57:685-6 N 27 '15 Government plans large outlays for defense. Iron Age 96:249-50 Jl 29 '15 National factor of safety, giving engineers

National factor of safety, giving engineers instruction in military matters. W: R. King. Eng Rec 71:133 Ja 30 '15 National security commission. Sci Am 111:486 D 12 '14

Opposition to government defense plans. Iron Age 96:340-1 Ag 5 '15 Organizing industry for national defense. Eng Rec 72:589 N 13 '15 Our unpreparedness against military devastation. H: A. W. Wood. Sci Am S 80:148-9 S 4 '15

Peace insurance. Sci Am 112:212 Mr 6 '15 Peril of our military unpreparedness. Sci Am 113:74 Jl 24 '15

President on national defense. Sci Am 113:442 N 20 '15

Proposed expenditures for five years for improving national defenses. Iron Age 96:1024

Specialized experience of engineers and contractors vital to country's defense. G: Perrine, il Eng Rec 72:594-6 N 13 '15

il Sci Am 112:118-20, 158-9+, 178-9, 198-9+ F 6-27 '15 United States an undefended treasure land.

See also United States—Army; United States—Militia; United States—Navy

### Engineer corps

Examinations for commissions, corps of engineers. Eng N 74:513-14 S 9 '15

# Engraving and printing, Bureau of

Comfort for workers in Washington's government buildings, D. A. Willey, il Sci Am S 78:373-4 D 12 '14
Electric wiring in a great government plant. E. C. Stanton, il plan Elec W 66:686-8, 744-6 S 25-O 2 '15

## Federal trade commission

Clayton act—and other things. W: H. Taft. Am Ind 15:34-7 Je '15

Am Ind 15:34-7 Je '15 Federal trade commission. J. E. Davies. Elec W 65:370-1 F 6 '15 Federal trade commission and the Clayton law. R. C. Butler and C. Lynde. Ry R 56: 442-3 Mr 27 '15 Federal trade commission at work. Am Ind 15: 13-16 Jl '15

Federal trade commission extending export in-quiry. Elec W 66:1054 N 6 '15; Ry R 57:602 N 6 '15

Federal trade commission investigates the for-eign market for American electrical goods. W. Fawcett. Elec R & W Elec'n 67:292-4 Ag

Federal trade commission rules of practice. Am Ind 15:16-17 Jl '15 Federal trade commission to continue work of Bureau of corporations and to consider ex-port combinations. Iron Age 95:649 Mr 18

Federal trade commission to help American business. Elec W 66:153-4 Jl 17 '15 Federal trade commissioners' power to invade Federal trade commissioners' power to invade large and small business houses in search of evidence. E. J. Buckley. Elec R & W Elec'n 66:525 Mr 20 '15; Same. Metal Work 83:169 Ja 22 '15

Federal trade relations commission. J. A. Emery. Am Ind 15:19-21 Je '15

History of the commission; its organization, powers and duties. J. A. Emery. Am Ind 15:7-10 Ap '15

Members of the Federal trade commission. Elec W 65:566 F 27 '15

Outline of powers and procedure. J. E. Davies. Am Ind 15:24-5 Mr '15

Progress of Federal trade commission work. Elec W 65:827 Mr 27 '15

Trade commission not to harass business. Iron Age 95:702-3 Mr 25 '15

What business asks of Trade commission. Iron Age 95:1293-4 Je 10 '15

What of the Federal trade commission act: steel manufacturers write of its possibilities. Iron Age 95:26-9 Ja 7 '15

What will trade commission do? S. E. Eld-ridge. Iron Tr R 56:388c F 18'15

## Foreign and domestic commerce, Bureau of

Dyestuffs and the Department of commerce. Textile World 50:147-9 N '15

## Geological survey

Competition of the U. S. geological survey with private engineering practice. H. C. Mitchell. Eng N 73:902-3 My 6 '15

Competition of the U. S. government w. private engineers, H. C. Mitchell; G: Smith. Eng N 73:789-90 Ap 22 '15

Propriety of government surveys for local use. W. N. Brown. Eng Rec 72:85-6 Jl 17 '15

U. S. geological survey and the topographical survey of Cincinnati, H. S. Morse, Eng N 73:902 My 6 '15

Work of the U.S. Geological survey, 1913-14. Eng Rec 70:650 D 12 '14

## Government printing office

Power plant of the government printing office, D. H. Tuck, diags plan Power 41:576-80 Ap 27 '15

United States -Continued

## Industries and resources

Industries and resources

America and the import problem. R. V. Sawhill. Iron Tr R 56:2-8 Ja 7 '15

Aspects of some chemical industries, in the United States, today. E: Gudeman. J Ind & Eng Chem 7:151-5 F '15

Contributions of the chemist to American industries; symposium. J Ind & Eng Chem 7:273-304 Ap '15

Contributions of the chemist to the industrial development of the United States—a record of achievement. B. C. Hesse. J Ind & Eng Chem 7:293-304 Ap '15; Same. Sci Am S 79:210-11, 234-5 Ap 3-10 '15; Abstract. Met & Chem Eng 13:287-8 My '15; Abstract and discussion. Textile World 49:53-5, 74-5+ Ap '15

Contributions of the chemist to various American industries: symposium. Met & Chem Eng 13:283 My '15
Develoging our resources. G: O. Smith. Metal Work 83:533 Ap 9 '15
Distribution of industrial opportunities. G: O. Smith. J Ind & Eng Chem 7:67-9 Ja '15
Doing without Europe. Sci Am 112:128, 157+, 176, 223 F 6-20, Mr 6 '15
Domestic supply of wool and dyestuffs. C: E. Wry. Textile World 49:95-6 Ap '15
Effect of the war on American industries. E: E. Pratt. Sci Am 113:203, 230-1 S 4-11 '15
Features of engineering in the West. H. F. Stratton. il maps Sibley J 29:139-49 F '15
Government co-operation with our industries. Sci Am 112:99 Ja 30 '15
How to break up a bad habit; what industrial

How to break up a bad habit; what industrial independence really means. D. Wells. Iron Tr R 56:429 F 25 '15

Industrial resources and opportunities of the Northwest, H. K. Benson, Met & Chem Eng 13:589-92 S 15 '15; Same, J Ind & Eng Chem 7:981-4 N '15

Organizing industry for national defense. Eng Rec 72:589 N 13 '15

Resources and possibilities of chemical industry in the Southwest. E. Baruch. Met & Chem Eng 13:604-8 S 15 '15

Status of the chemical industries in the United States at the end of 1915. I. F. Stone. J Ind & Eng Chem 7:991-3 N '15; Same. Sci Am S 80:286-7 O 30 '15

War orders and American industry, Eng M 49: 481-8 Jl '15

See also Agriculture—United States; Chemical industries; Dye industry; Electric industries—United States; Forests and forestry—United States; Mines and mineral resources—United States; United States—Commerce; Water power—United States; also names of industries

## Insular possessions

American Samoa. Sci Am 112:81 Ja 23 '15 See also Hawaiian islands; Philippine islands

## Labor, Department of

Department of labor to find workmen for man-ufacturers. Iron Age 95: 223 Ja 21 '15

### Lighthouse service

Sec Lighthouse service (United States)

### Manufactures

Clearing house for manufacturers. G: H. Manlove. Iron Tr R 56:20+ Ja 7 '15

For America first. Iron Tr R 56:21-30 Ja 7 '15

## Militia

Mobilizing the engineer companies of the militia. D. A. Tomlinson. il Eng Rec 72:314-15 S tia. D.

Nationalization of the national guard, E. W. Duke. il Sci Am 113:394-5+ N 6 '15

Plan for increasing our military strength. J: R. Charlesworth. Sci Am 113:43 Jl 10 '15

Volunteer engineer officers. Eng & Min J 100: 796-7 N 13 '15

What the national guard needs. W. W. Wright. Sci Am 112:492-3 My 29 '15

## Mines, Bureau of

4th annual report of the director of the U. S. Bureau of mines. M. L. Hamlin. J Ind & Eng Chem 7:69-70 Ja '15
Government publicity methods. W. O. Snelling. Met & Chem Eng 13:272-3 My '15
Report of the Bureau of mines. Sci Am S 79:35

United States mining statutes annotated. J. W. Thompson. U S Bur Mines Bul 94:pt 2, 916-30

### Naval consulting board

Bureau of invention and development. Sci Am

Bureau of invention and development. Sci Am 113:74 JI 24 '15 Developing naval inventions by a government bureau. Eng N 74:179-80 JI 22 '15 First meeting and first recommendation. Met & Chem Eng 13:708-9 O 15 '15.
First meeting, Washington, D. C., Oct. 6. Am Inst Min E Bul 108:xiii-xiv D '15 First meeting, Washington, D. C., Oct. 6, 1915. Am Soc M E J 37:xxiii-iv N '15 2d meeting, New York city, Nov. 4. Am Soc M E J 37:xvii-xviii D '15 Membership of the Naval advisory board of inventions. Sci Am 113:276+ S 25 '15 Naval advisory board. Elec W 66:620-1 S 18 '15

Naval advisory board. T: Robins. Elec W 66: 334-5 Ag 14 '15 Naval advisory board. T: Robins. Elec W 66: 334-5 Ag 14 '15
Naval advisory board may be enlarged. Elec W 66:313 Ag 7 '15
Naval advisory board of inventions. pors Sci Am 113:301+, 326+ O 2-9 '15
Naval consulting board personnel. Eng M 50: 199-221 N '15

Naval inventions board. Eng N 74:234-5 Jl 29

Navy advisory board of inventors. Elec W 66: 173-4 Jl 24 '15
Part of the civilian engineer in naval preparedness. F. J. Sprague. Eng M 50:169-72 N '15
U. S. naval advisory board. Eng N 74:573-4 S 16 '15

Well-known engineers named on Naval advis-ory board. Eng Rec 72:368 S 18 '15

Analysis of our naval standing. G: von L. Meyer, il Sci Am 112:339-40, 359-60 Ap L. Meye 10-17 '15

Battle-cruiser. Sci Am 112:304 Ap 3 '15
Building program; quoted from reports of
Secretary Daniels and chiefs of bureaus.
Engineer 119:311-12 Mr 26 '15
Efficiency in conduct of office business; new
methods in a naval bureau. Ry R 57:472-4

O 9 '15

Engineering in the navy. W. L. R. Emmet. Gen Elec R 18:1097-8 D '15 For peace and prosperity with a fighting navy to protect them. J: R. Dunlap. Eng M 50: 161-8 N '15

How the navy department is organized. Eng M 50:195-8 N '15 Laboratory-not a navy yard. Sci Am 113:354

O 23 '15
Laboratory's the thing. Sci Am 113:90 Jl 31 '15
Naval research laboratory. F. J. Sprague. Sci
Am 113:397 N 6 '15
Naval review at New York. Sci Am 112:473
My 22 '15
Navy for defense. Sci Am 113:4 Jl 3 '15
Navy—our first line of defense. il Sci Am 112:
121-3; 113:266 F 6, S 25 '15
Navy's most pressing need. Sci Am 113:38 Jl
10 '15

Navy's most pressing need, set 10 '15 10 '15 Need of an enrolled naval reserve. Int Marine Need of an enrolled naval reserve. Int Marine Need of an enrolled naval reserve.

Need of an enrolled naval reserve. Int Marine Eng 20:317-18 JI '15 Old navy and the new. W. M. McFarland. Int Marine Eng 20:174 Ap '15 Organization of an engineering reserve for the navy. A. C. Meyers. Int Marine Eng 20:464 O

Our naval development as related to national defense. J: R. Edwards. Eng M 50:173-94 N

Plan for methodical increase of the navy. W: B. Chalfant. Sci Am 113:43 Jl 10 '15

Rehabilitating the United States navy. Sci Am 113:374 O 30 '15

Ships and navy for the Americas. W: L. Saunders. Eng M 50:172a-172d N '15

Jnited States-Navy Continued

Standard marine electrical installations. H. A. Hornor, il diags Am Inst E E Pro 34:1515-48

Target practice in our navy. Sci Am 113:58 Jl 17 '15

To the Hon. Josephus Daniels, secretary of the navy. Sci Am 112:448 My 15 '15 Valor of ignorance; Mr. Kitchin's comparison

of American and German navies, Sci Am 113: 482 D 4 '15

We should build battle-cruisers. Sci Am 113: 106 Ag 7 '15

See also United States—Defenses; United States—Naval consulting board

### Patent office

Patent office

Big handicap to industry. I., W. Moffett. 1

Iron Tr R 56:557-60 Mr 18 '15

Evil of divided applications in the Patent office, F. Keiper. Sci Am 112:139 F 6 '15

Needed changes in the patent system. Met & Chem Eng 13:468-9 Ag '15

Patent office and invention since 1845. W; I. Wyman. Sci Am 112:533-4+ Je 5 '15

Report of the commissioner of patents. Sci Am 112:205+ F 27 '15

Rules of practice of the United States Patent office. M. Tibbetts. Sci Am 113:467 N 27 '15

Suggestions regarding patent office practice. J: F. Robb. Sci Am 113:397 N 6 '15

Work and needs of the United States Patent office. T: Ewing, Sci Am 111:491 D 12 '14

See also Patent laws and legislation

See also Patent laws and legislation

## Politics and government

How Uncle Sam helps commerce, A. H. Baldwin, Iron Tr R 55:1231-2 D 31 '14

## Printing and engraving, Bureau of

New building for the Bureau of engraving and printing, il diags Arch & Bldg 46:463-70 D '14

## Public health service

U. S. public health service, H. P. Letton. Munic J 38:220 F 18 '15

## Public lands

See Forest reserves; Public lands

## Public roads, Office of

Reorganization of the U.S. Office of public roads, Good Roads n s 9:144 Ap 3 '15

## Purchasing

How to sell tools to the government. L. W. Moffett, il Iron Tr R 56:1101-5 Je 3 '15 Purchasing supplies for the Panama canal. F. C. Boggs. Iron Age 96:1180-2, 1226-7 N 18-25 '15

## Standards, Bureau of

Standards, Bureau of
Fees for electric, magnetic, and photometric
testing. U S Bur Stand Circ 6:1-27 '14
National Bureau of standards and standards
for public utilities. H. T. Wade. Eng M
49:240-51 My '15
Public utilities work of the Bureau of standards. Elec W 64:1187-8 D 19 '14
Recent researches in electricity at the Bureau
of standards. E. B. Rosa. il plan J Fr Inst
180:539-59 N '15
Relation of standards to the development of
engineering. W. S. Stratton. Am Soc M E J
37:38-40 Ja '15
Report of the director of the Bureau of standards; excerpts. Am Gas Light J 102:108-9
F 15 '15; Same. J Fr Inst 179:216-23 F '15
U. S. Bureau of standards test weight car no.
2, il Ry R 57:483-4 O 16 '15
What the National bureau of standards is doing. E. B. Rosa. Elec W 66:527 S 4 '15

## State department

Handling correspondence at the United States Department of state. W. Fawcett. il Inland Ptr 56:109-12 O '15

United States smelting, refining & mining c Report for 1914. Eng & Min J 99:823 My

United States steel corporation Corporation exhibit at Frisco; model mines and steel plants. E. C. Kreutzberg. il Iron Tr R 56:332-3+ F 11 '15

Corporation wins forty-six awards. Iron Tr R 57:149 S 2 '15 Decision in the steel corporation case. Eng & Min J 99:1016 Je 12 '15

Exhibit of the United States steel corporation at the Panama-Pacific exposition, San Francisco; views. Iron Tr R 56:682a-682d Ap

1 '15
Films and models attract interest in exhibit at Panama-Pacific international exposition. il Iron Tr R 57:402-3 Ag 26 '15
Full text of decision in the United States district court for the district of New Jersey. Iron Tr R 56:1171-1218 Je 10 '15
1914 report. Iron Age 95:679-81 Mr 25 '15
Report covering 1914. Eng & Min J 99:584-5

Mr 27 '15.

Some features of the United States steel corporation's report for 1914. Eng & Contr 43:329-30 Ap 14 '15

Steel corporation at Panama-Pacific exposition, Colliery 35:389-90 F '15

Steel corporation wins government's dissolution suit. Ry R 56:769-70 Je 5 '15

United States steel corporation exhibit at the Panama-Pacific exposition, Iron Age 94:1425-6 D 17 '14

United States steel corporation wins its suit. Iron Age 95:1299-1301+ Je 10 '15

United typothetae and Franklin clubs of America
Digest of the proceedings of the twenty-ninth
annual convention, Inland Ptr 56:229-32 N

Photometric units. P. G. Nutting. Elec W 65: 332-3, 645 F 6, Mr 13 '15

Proposed unit of brightness. Elec W 65:715 Mr 20 '15

Relation of the horse-power to the kilowatt. Sci Am S 79:162-3 Mr 13 '15

Unit of brightness, H. E. Ives. Elec W 65;460 F 20 '15

See also Horsepower; Weights and measures

Universal City, California Strangest city in the world, il Sci Am 112: 365 Ap 17'15

## Universal joint. See Joints

University extension

Methods of instruction in engineering extension; with discussion, K. G. Smith. W Soc E J 20:266-86 Mr '15

Unloading. See Loading and unloading

Unsaponifiable matter in greases. E. Twitchell. J Ind & Eng Chem 7:217-18 Mr '15

Estimation of uranium and phosphorus. H. D. Newton and J. L. Hughes. Am Chem Soc J 37:1711-13 Jl '15

Radium: uranium ratio in carnotites. S. C. Lind and C. F. Whittemore. diags Am Chem Soc J 36:2066-82 O '14

Radium-uranium ratio in carnotites. S. C. Lind and C. F. Whittemore, il diags U S Bur Mines Tech Pa 88:1-28 '15

## Urazoles

n 1-phenyl-4,5-dihydro-5-oxy-3-triazolylsul-finic acid and 1-phenyl-4,5-dihydro-5-oxy-3-triazolylmethysulfone. E. W. Esslinger and S. F. Acree. Am Chem Soc J 37:183-9 Ja '15

Comparative behavior of thiourea and urea towards acetic anhydride, E: F. Kohmann. Am Chem Soc J 37:2130-3 S '15

## Urease

Retention of activity by urease and by oxidase after exposure to the temperature of liquid air. J. S: Hepburn and C: B. Bazzoni. bibliog J Fr Inst 180:603-5 N '15

Studies on enzyme action; some experiments with castor bean urease. K. G: Falk and K. Sugiura. Am Chem Soc J 36:2166-70 O '14

Local venting of plumbing fixtures. J. Graham. diags Dom Eng 71:152-3 My 8 '15

Observations of the excretion of creatinine by women. M. Hull, Am Chem Soc J 36:2146-51 O'14

Urine

Urinod, the cause of the characteristic odor of urine. W: M. Dehn and F. A. Hartman. Am Chem Soc J 36:2136-46 O '14 Volatile substances of urine. W: M. Dehn and F. A. Hartman. Am Chem Soc J 36:2118-36 O '14

Analysis

Nephelometric estimation of purine bases, including uric acid, in urine and blood. S. S. Graves and P. A. Kober. Am Chem Soc J 37:2430-47 O '15

Urinod

Urinod, the cause of the characteristic odor of urine. W: M. Dehn and F. A. Hartman. Am Chem Soc J 36:2136-46 O '14

Uruguay

Economic conditions

Financial developments in South American countries. W: H. Lough, U S Bur For & Dom Com 103:39-42 '15

Uruguayan finance. Am Ind 16:42-3 N '15

Industries and resources

Government electric power and telephone system in Uruguay. Elec R & W Elec'n 67:31 Jl 3 '15

See also Mines and mineral resources-Uruguay

Utah

See also Geology-Utah; Mines and mineral resources-Utah

Capitol

Utah state capitol, il Arch & Bldg 47:324-30 S

Industries and resources

Disseminated copper ores of Bingham Can-yon, Utah. J. J. Beeson. il diags Am Inst Min E Bul 107:2191-236 N '15

Utah copper co., Bingham, Utah Report for 1914. Eng & Min J 99:824-5 My 8

Report for the last quarter of 1914. Eng & Min J 99:408 F 27 '15

Utilities bureau

tilities bureau
 Philadelphia valuation conference—some editorial views. Eng Rec 72:620-1 N 20 '15
 Valuation conference, Philadelphia, Nov. 10-12, 1915. Eng N 74:1002-3 N 18 '15; Elec Ry J 46:990-5, 1031-4 N 13-20 '15; Elec R & W Elec'n 67:939-41 N 20 '15; Elec W 66:1125-9 N 20 '15; Eng Rec 72:643-5 N 20 '15; Munic J 39:788-9 N 18 '15

Utilities indemnity exchange Reciprocal liability insurance for utilities and other electrical interests. Elec R & W Elec'n 66:1055 Je 5 '15

Utility galleries. See Subways (conduits)

Vaccination

Vaccine virus not the cause of tetanus. Sci Am S 80:155 S 4 '15

Vacuum

Condensers for evaporating apparatus. E. W. Kerr, diags Met & Chem Eng 13:551-7 S 1 '15 Effect of vacuum in steam turbines. G. G. Stoney. Engineer 118:521-3 N 27 '14; Same cond. Sci Am S 79:69 Ja 30 '15; Same cond. Power 41:312-16 Mr 2 '15; Discussion. Engineer 118:502-3 N 27 '14 Getting the proper vacuum in summer. J. Wilmore, diags Elec W 66:358-63 Ag 14 '15 Handy conversion table for low pressures. E. H. Peterson. Power 42:338 S 14 '15 High vacuums with surface condenser. il Power 42:338-9 S 7 '15 Method of lifting oil for a gravity-feed system by use of condenser vacuum. A. Kuylenstjerna, diags Elec W 66:144 N 20 '15 Most economical vacuum for turbines. W. H. Herschel. Power 41:744-7 Je 1 '15

Popular misconceptions concerning condensers, F. R. Low. Power 42:16-17 Jl 6 '15 Vacuum wrecks pipe line. il Metal Work 84: 217 Ag 13 '15

Vacuum cleaning

acuum cleaning
Electrically driven vacuum sheet-cleaner for
cylinder presses, il Elec R & W Elec'n 66:
175 Ja 23 '15
Hotpoint electric vacuum cleaner, il Elec R &
W Elec'n 67:488 S 11 '15
Perry aspirator for vacuum cleaning, il Dom
Eng 72:183 Ag 7 '15
Use of the vacuum system for cleaning cars in
San Francisco, F, W, Allen, il Elec Ry J 46:
516-17 S 18 '15
Vacuum cleaner with adjustable nozzle, il
Elec W 66:994 O 30 '15
Vacuum cleaning cars, E, J, Haines, il Elec Ry
J 46:323 Ag 21 '15
Vacuum cleaning test in Hartford school building, plan Heat & Ven 12:61 Ag '15

Vacuum pans Classifications, principles, tests. E. W. Kerr, J. F. Gunther, and W. A. Rolston. diags Met & Chem Eng 13:485-92 Ag '15

Vacuum pumps

Combined air compressor and vacuum pump. il diags Engineer 119:143 F 5 '15
Electrically operated vacuum pump by the Ingersoll-Rand co. il Elec W 66:988 O 23 '15;
Elec R & W Elec'n 67:777 O 23 '15; Iron Age 96:882 O 14 '15; Met & Chem Eng 13:769-70 O 15 '15; Power 42:711-12 N 23 '15; Ry Age (Mech ed) 89:594 N '15
Electrically operated vacuum pump by the May-Nelson mfg. co. il diag Elec W 66:1109-10 N 13 '15; Elec R & W Elec'n 67:1035 D 4 '15

Unity cylinder ratio for dry-vacuum pumps. R. S. Howard. Power 42:327-8 S 7 '15 Vacuum pump for vacuum heating and vacuum filtration systems. il Met & Chem Eng 12: 795-6 D '14

Valence (chemistry)
Criticism of the electron conception of valence, R. F. Brunel, Am Chem Soc J 37:709-22

Criticism of the electron conception of val-ence, R. F. Brunel, Am Chem Soc J 37:709-22 Ap '15 Electron conception of valence: inorganic com-pounds. J. M. Nelson and K. G: Falk, Am Chem Soc J 37:274-86 F '15 Electron conception of valence: the theory of electrolytic dissociation and chemical action. K. G: Falk and J. M. Nelson. Am Chem Soc J 37:1732-48 JI '15 Electronic conception of positive and negative valences. H. S. Fry. Am Chem Soc J 37:2368-73 O '15

Interpretations of some stereochemical prob-lems in terms of the electronic conception of positive and negative valences. H. S. Fry Am Chem Soc J 37:855-92 Ap '15

Theory of valency and molecular structure W: C. Arsem. diags Am Chem Soc J 36:1655-75 Ag '14

Valence of nitrogen in ammonium salts. W: A Noyes and R. S. Potter, Am Chem Soc. 37:189-203 Ja '15

See also Substitution (chemistry)

Valleys

Stream-valleys and their meaning. Sci Am \$ 80:256 O 16 '15

Valparaiso, Indiana

Water supply

Water works of Valparaiso, Ind. E. L. Loomis il Munic Eng 49:9-12 Jl '15

Valuation

Analysis of elements of cost of a complet plant unit. W. J. Huddle, Eng & Contr 44 139-40 Ag 25 '15

Appraisement of small electric properties E. D. Dreyfus. Elec R & W Elec'n 66:433-8 500-5 Mr 6-13 '15

Engineer's idea of values is usually confused Prof. John R. Common's views. Eng & Cont 43:284 Mr 31 '15

Foundation principles of valuation, B. J. Ar nold. Elec Ry J 46:713-19, 803-6 O 9-16 '15 Discussion. 46:732-3 O 9 '15

Fundamentals of appraisal and valuation M. E. Cooley. Elec Ry J 46:913 O 30 '15

Valuation Continued.

Handy book-form data sheet for valuation work. R. E. Klotz. il Eng N 74:794 O 21 '15 Kalamazoo situation. W: Newbigging. Am Gas Light J 103:38-9 Jl 19 '15

Overhead charges in valuation. R: H. Tingley. Ry Age 58:1247-8 Je 11 '15

Pacific gas and electric company valuation methods. Am Gas Light J 102:179 Mr 22 '15 Philadelphia valuation conference—some editorial views. Eng Rec 72:620-1 N 20 '15

Reproduction basis of valuation criticised. J: M. Eshleman. Eng Rec 72:625-6 N 20 '15

Symposium on inventories and appraisals of properties. C. L. Cory; W. G. Vincent, jr.; W: J. Norton. Am Inst E E Pro 34:2131-58 S '15

Unique problem in valuation; inheritance tax

S '15
Unique problem in valuation; inheritance tax appraisal of the Hales Bar hydro-electric plant. L: L. Tribus. Eng N 73:384-5 F 25 '15
Utilities bureau convention, Philadelphia, 1915; valuation conference. Eng N 74:1002-3 N 18
'15; Elec Ry J 46:1990-5, 1031-4 N 13-20 '15; Elec R & W Elec'n 67:939-41 N 20 '15; Elec W 66:1125-9 N 20 '15; Eng Rec 72:643-5 N 20 '15; Munic J 39:788-9 N 18 '15
Valuation of merchandise inventories. J Account 18:461-3 D '14

See also Depreciation; Machinery—Valuation; Mine valuation; Public service corporations—Valuation; Railroads—Valuation; Real estate; Street railroads—Valuation; Waterworks—Valuation

Valuation of railroads. See Railroads-Valuation Valves

Adsco graduated radiator valve. diag Power 41:

Air compressor valve is designed for super-heated steam, il Eng Rec 72:680 N 27 '15 Air compressor valve of steel strips, il Iron Age 95:1010 My 6 '15

Age 95;1010 My 6 '15
American-made reducing valve. C. F. Williams, il Iron Tr R 56:16 Ja 7 '15
Analysis of the motion of suction and pressure valves; abstract. O. Klepal. diags Am Soc M E J 37;717-19 D '15
Atlas regulating valve. il Power 42:394 Ag 31

Automatic stop valves. W. L. Durand; J. C. Hawkins. Power 42:239-40 Ag 17 '15 Auxiliary exhaust valves on uniflow engines. A. D. Skinner. diag Power 41:448-50 Mr 30 '15.

'15
Auxiliary exhaust valves on uniflow engines.
R. Trautschold. Power 42:59-60 Jl 13 '15
Auxiliary exhaust valves on uniflow engines.
W. Turnwald. Power 41:515-16 Ap 13 '15
Bradford automatic nonreturn boiler stop
valve. diag Power 40:886 D 22 '14
Clear way pump valve. diag Engineer 119:
212 F 26 '15
Cochrage multiport flow valve. il Power 41:

Cochrane multiport flow valve, il Power 41; 508 Ap 13 '15
Data' on reducing valves, T: Tait, Dom Eng

71:5 Ap 3 '15
Defective valves cause slippage in pumping engines. A. A. Wood, il Eng Rec 71:598 My 15

8 15
Designing high-pressure steel valves. E. G. Greenman, diag Iron Age 96:125-6 Jl 15 '15
Diaphragm-operated triple valve, diags Ry Age (Mech ed) 89:92-4 F '15
Dole vacuum valve, il Dom Eng 72:351 S 18 '15
Double-cushioned non-return valves, diag Elec Ry J 46:338 O 16 '15
Electrically operated stop valve, diags Power 41:840-1 Je 22 '15
Exhaust passage drain valve, diags Ry Age (Mech ed) 89:586 N '15
Facing up rubber pump valves. S. H. Farns-

(Mech ed) 89:586 N '15
Facing up rubber pump valves. S. H. Farnsworth. diags Power 42:453 S 28 '15
Finishing tank valve castings. W. W. Elfe. il
Ry Age (Mech ed) 89:82 F '15
Flushing valve design and installation. diags
Metal Work 82:603-5, 710-11; 83:119-21, 157-9
N 6, 27 '14, Ja 15-22 '15
Forty-million-revolution compressor-valve test.
il Power 41:537-8 Ap 20 '15

Golden-Anderson automatic non-return valve. diag Ry Age (Mech ed) 89:596 N '15

High pressure gas valve. il Ry Age (Mech ed) 89:44 Ja '15

Hovalco blowoff valve. il Power 42:588 O 26 '15

Important points when installing motor-operated valves. Elec W 65:1626 Je 19 '15
Lack of synchronism in check-valve action.
S. F. Jeter. diags Power 41:48 Ja 12 '15
Lunkenheimer balanced throttle valve. il
Power 41:814 Je 15 '15
Making superheated steam gate valves. il
Iron Age 95:845-7 Ap 15 '15
Multiplex atmospheric exhaust relief valve. il
Power 42:368 S 14 '15
New high-pressure gas valve. il Met & Chem
Eng 12:794-5 D '14
No. 8 Hoffman return line valve. il Dom Eng
73:246 N 20 '15
Outfit for truing valves. D. A. Hampson. diag

Eng 12:794-5 D '14

No. 8 Hoffman return line valve. il Dom Eng 73:246 N 20 '15

Outfit for truing valves. D. A. Hampson. diag Horseless Age 35:347 Je 23 '15

Piston valves applied to slide valve cylinders. il Ry Age (Mech ed) 89:258 My '15

Plate valves for high-speed air compressors. G. J. MacFadden. diags Power 41:366-8 Mr 16 '15; Same cond. Eng M 49:260-1 My '15

Powell automatic and double-automatic stop valve. diags Power 41:127-8 Ja 26 '15

Priming a centrifugal pump. E. M. Ivens. il diags Power 41:880-2 Je 29 '15

Reducing piston valve leakage. V. T. Kropidlowski, diags Ry Age (Mech ed) 89:359-60 Jl '15

Jl '15

idlowski, diags Ry Age (Mech ed) 89:359-60 Jl '15
Reeves adjustable piston valve, il Power 42: 503 O 12 '15
Reseating a ball engine valve, R. A. Jannet, diags Power 41:518 Ap 13 '15
Rotary four-way valve, E. H. Wolf, diags Ry Age (Mech ed) 89:542 O '15
Rotary valve progress, diags Horseless Age 35:249 F 17 '15
Rothenbucher reversible pump valve, diag Power 42:752 N 30 '15
Rub-steel pump valve, il Power 41:803 Je 15 '15
Setting double-eccentric Corliss valves, R. L. Shipman, Power 42:164 Ag 3 '15
Simplate valve—its construction and operation, diags Eng & Contr 44:297-8 O 13 '15; Ry Age (Mech ed) 89:545-6 O '15; Eng & Min J 100:805-6 N 13 '15; Eng M 50:sup4-5 N '15; Int Marine Eng 20:524 N '15; Power 42:615-16 N 2 '15; Mach 22:346 D '15
Simple, durable, electrically operated gasvalve, Z. Ostenberg, il J Ind & Eng Chem 7: 872 O '15; Same, Am Gas Light J 103:279 N 1 '15

Solenoid attachment for automatic altitude valves diag Eng Rec 70:sup289 D 12 '14 Steam stop valves: a survey of the field of design. L. C. Bowes. diags Sibley J 29:231-40, 249-50, 272-84, 293-4 Ap-My '15

-in. gate valve for blast furnaces: sket P. E. Barbour. Eng & Min J 99:449 Mr 6

Use of se of relief valves on cupola blast pip<mark>es.</mark> Foundry 43:26-7 Ja '15

Valve part manufacturing on a bench lathe. il diags Mach 22:49-50 S '15

Valve requirements of boilers. T. W nolds. plans Elec W 66:976-8 O 30 '15

What broke the valve? E. Hurst; F. S. Hearne. diag Power 42:451 S 28 '15

What broke the valve? N. Olson, diags Power 42:309 Ag 31 '15

What broke the valve? W. J. Jone Butler, diag Power 42:761 N 30 '15 Jones: W: A.

See also Automobile engines—Valves; comotives—Valves and valve gear; Sevalves; Slide valves; Steam engines

## Cleaning

Cleaning triple valves. il Ry Age (Mech ed) 89:568 N '15

Valves, Hydraulic

Automatic compensation water valve, il diag Engineer 119:609 Je 18 '15 Automatic control apparatus for hydraulic gate valves, diag Eng & Contr 43:408 My 5 '15; Ry Age 58:1072 My 21 '15

Automatic gate-valve control. diag Eng N 73: 1098 Je 3 '15

Description of tests of butterfly valves on locks in the Black Warrior region, in Ala-bama; abstract. C: Keller, diags Am Soc M E J 37:613-14 O '15

Dexter gate-valve reseater, il Power 42:300 Ag

Valves, Hydraulic—Continued
Experiences with electrically operated valve
installations, under remote control, in New
York city, A. Williamson, Eng & Contr 44:
225 S 22 '15

Hydraulic rolling mill operating valve. diag Iron Age 96:811 O 7 '15 Johnson hydraulic valve. il Eng M 48:sup2-4 Ja

'15
New hydraulic stop valve, C. W. Larner, il diags Eng N 72:1102-3 D 3 '14
New hydraulic valve, il Power 41:138 Ja 26 '15
Reasons for retaining the solid wedge type of valve in Boston, G: H. Finneran, Eng & Contr 44:224-5 S 22 '15
Standard gate valves of the New York city waterworks, il diags Eng N 73:1016-18 My 27 '15

Successful application of valve inserting ma-chine under high pressure. il Eng & Contr 44:98 Ag 4'15

chine under high pressure. il Eng & Contr 44:98 Ag 4'15
Tests of butterfly valves result in modified design. diag Eng Rec 72:419 O 2'15
Twenty-ton valve lowered down 250-foot shaft in 20 min. R. W. Greenlaw. il Eng Rec 71: 181 F 6'15
Two new large Johnson valves, Oneida plant, Phoenix, Utah. il Eng N 74:507 S 9'15; Iron Age 96:412-13 Ag 19'15
Water motors operate gate-valves in nozzle lines. J. W. Swaren. il Eng Rec 72:134 Jl 31'15

Vanadium

anadium Romantic story of vanadium, C. J. Stark, il Iron Tr R 57:781-1+ 0 21 15 Simplified ferrous sulfate method for the determination of vanadium in steel, G: T. Dougherty, J Ind & Eng Chem 7:419-20 My

Tests of vanadium iron castings. Foundry 43: 179-80 My '15; Same. Iron Tr R 57:221-2 Jl 29 '15

29 '15 Vanadium from oxide to steel. W. F. Bleecker and W. L. Morrison. Met & Chem Eng 13: 492-4 Ag '15 Vanadium in brass. R. J. Dunn and O. F. Hud-son. Metal Ind n s 13:330 Ag '15 Vanadium in German ores. L. Blum. Iron Age 95:347 Ap 15 '15

95:847 Ap 15 '15

Vanadium steel
Annealed carbon-vanadium product to replace
heat-treated forgings for locomotives. Iron
Age 95:1298 Je 10 '15; Ry R 56:810 Je 12 '15
Properties of vanadium steel and its use in
long-span bridges. G: L. Norris. Eng &
Contr 42:495-6 N 25 '14
Test of vanadium rails. il Elec Ry J 45:388 F
20 '15; Iron Age 95:398 F 18 '15
Vanadium from oxide to steel. W. F. Bleecker
and W. L. Morrison, Met & Chem Eng 13;
492-4 Ag '15
Vanadium not a scavenger. E. W. Strong.
Iron Age 96:1250 N 25 '15
Vanadium steel rails of 105-lb. section. D. L.

Vanadium steel rails of 105-lb, section, D. L. & W. R. R. il Ry R 56:249-51 F 20 '15; Summary, Ry Age 58:332 F 19 '15

What is vanadium steel? D. J. Evans. Mach

What is vanadium steel? J. L. Uhler. Iron Age 96:1250-1 N 25 '15

Van Buren bridge route New Canada-New England railroad link com-pleted, maps Eng Rec 71:559 My 1 '15

# Vancouver, British Columbia

## Railroads

Terminal improvements of the Canadian Pacific railway at Vancouver, il plan Eng N 73:340-1 F 18 '15; Same, Ry R 56:380-5 Mr 20 '15

Vanilla extract

Acidity and ash of vanilla extract. A. L. Winton, A. R. Albright and E. H. Berry. J Ind & Eng Chem 7:516-19 Je '15

Modification of Wichmann's method for the detection of small amounts of coumarin, particularly in factitious vanilla extracts. J. R. Dean. J Ind & Eng Chem 7:519 Je '15

Vanillin Condensation of vanillin and piperonal with certain aromatic amines. A. S. Wheeler, Am Chem Soc J 37:1362-4 My '15 Effect of certain organic compounds on wheat plants in the soil. F. W. Upson and A. R. Powell. il J Ind & Eng Chem 7:421 My '15

Vapor density

apor density
Densities and degrees of dissociation of the saturated vapor of phosphorus pentachloride.
A. Smith and R. H. Lombard. diags Am Chem Soc J 37:2055-62 S '15
Densities and degrees of dissociation of the saturated vapors of the ammonium halides, and the related thermal data. A. Smith and R. H. Lombard. Am Chem Soc J 37:38-70 Ja '15

Measurement of vapor pressure lowering by the air saturation method. E: W. Washburn and E: O. Heuse, il diags Am Chem Soc J 37: 309-21 F '15

Method of finding the partial from the total vapor pressures of binary mixtures, and a theory of fractional distillation. M. A. Rosanoff, C. W. Bacon, and J: F. W. Schulze. Am Chem Soc J 36:1993-2004 O '14

Partial vapor pressures of ternary mixtures of toluene, carbon tetrachloride and ethylene bromide. M. A. Rosanoff, J: F. W. Schulze, and R. A. Dunphy. Am Chem Soc J 36:2480-95 D '14

Rapid laboratory method of measuring the

36:12480-95 D 14
Rapid laboratory method of measuring the partial vapor pressures of liquid mixtures.
M. A. Rosanoff, C. W. Bacon and R. H. White. diags Am Chem Soc J 36:1803-25 S

Studies of the vapor pressure of solutions; a static method for the determination of the difference between the vapor pressure of solution and that of solvent. J. C. W. Frazer and B. F. Lovelace. diags Am Chem Soc J 36:2439-49 D '14

Vapor pressure of arsenic trioxide. H, V. Welch and L. H. Duschak. il U S Bur Mines Tech Pa 81:1-20 '15

Vapor pressure of ethane and ethylene at tem-Vapor pressure of ethane and ethylene at temperatures below their normal boiling points. G. A. Burrell and I. W. Robertson, diags Am Chem Soc J 37:1893-1902 Ag '15
Vapor pressure of iodine between 50° and 95°, G. P. Baxter and M. R. Grose, Am Chem Soc J 37:1061-72 My '15
Vapor pressure of thallium amalgams. J. H. Hildebrand and E. D. Eastman, Am Chem Soc J 37:2452-9 N '15
Vapor pressures of sectivene ammonia and

Vapor pressures of acetylene, ammonia and isobutane at temperatures below their normal boiling points. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:2482-6 N '15

Vapor pressures of certain alcoholic solutions. O. F. Tower and A. F. O. Germann. il Am Chem Soc J 36:2449-56 D '14

Vapor pressures of propane, propylene and normal butane at low temperatures. G. A. Burrell and I. W. Robertson. Am Chem Soc J 37:2188-93 S '15

Vapor pressures of silver, gold and bismuth amalgams. E. D. Eastman and J. H. Hilde-brand. diags Am Chem Soc J 36:2020-30 O

Vaporization. See Evaporation

Vapors Composition of paint vapors. C. A. Klein. J Ind & Eng Chem 7:99-102 F '15

Study of vapors from drying paint films. H. H. King. diags J Ind & Eng Chem 7:502-4 Je

See also Evaporation; Gases; Steam; Vapor density; Vapor pressure

Variation (biology) Mutation and modification of bacteria. Lankester. Sci Am S 79:319-20 My 15 '15

Varnish and varnishing Constitution of Chinese wood oil varnishes. E. E. Ware and C. L. Schumann. J Ind & Eng Chem 7:571-3 Jl '15

Contributions of the chemist to the paint and varnish industry. M. Toch. J Ind & Eng Chem 7:938 N '15

Determination of methyl and ethyl alcohol in spirit varnishes. G. W. Knight and C. T. Lincoln. J Ind & Eng Chem 7:837-43 O '15 Sec also Japanning; Lacquer

Vaudremer, Emile, 1829-1914

Sketch and appreciation, J. P. Alaux; L. Brachet; W. Cook, il plans Am Inst Arch J 3: 292-9 Jl '15

Vaulting, See Domes: Vaults

Bank vault contains new shop fabricated unit reinforcement. il Eng Rec 72:sup161 O 23

Strongest vault in the world. il Sci Am S 79: 169 Mr 13 '15

Vector diagrams. See Electric currents, Alternating

Vegetable ivory
Concerning the nutritive value of vegetable ivory—preliminary notes. C. L. Beals. J Ind & Eng Chem 7:161 F '15

Vegetable oils. See Oils and fats

Vegetarianism

Investigation of vegetarianism, Sci Am 112: 381 Ap 21 '15

Vehicles

Measuring shocks of vehicles and vibrations of buildings. A. Boyer-Guillon, il diags Sci Am S 78:364-5 D 5 '14

See also Automobiles; Cars; Electric vehicles; Motor vehicles

Veneers and veneering

Where veneers are used. Am Ind 15:36-7 My

Venice

Harbor

Works for the improvement of navigable estu-aries; abstract. L. Luiggi. Eng Rec 72:637-8 N 20 '15

Venom

Animal venoms and venomous animals. Sci Am S 80:345 N 27 '15

Ventilating fans. See Fans, Mechanical

Ventilation

'entilation'
Advance in heating and ventilating field. R. C. Carpenter. Metal Work 84:431-3 O 1 '15
Air conditioning in a moving picture laboratory. Il plans Heat & Ven 12:20-6 F '15
Air ozonation. M. W. Franklin. J Ind & Eng Chem 6:850-2 O '14; Same. Am Soc Heat & V E 20:337-50 '14; Excepts. Heat & Ven 11: 28-34 O '14; Metal Work 83:722-3 My 21 '15
American society of heating and ventilating engineers twenty-first annual meeting, January 20-22, 1915. Heat & Ven 12:39-48 F '15
Analysis of modern ventilation theories.
J. M. W. Kitchen. Heat & Ven 12:30-1 Mr '15

J. M. '15

'15
Architect on modern ventilation ideas. C: S. Kaiser. Heat & Ven 12:45-6 S '15
Blower systems for heating and ventilating. A. M. Feldman. diags Dom Eng 69:257 N 28
'14: Same. Am Soc Heat & V E 20:412-15 '14
Chicago ventilation commission first report. il Metal Work 83:632-5+ Ap 30 '15
Developments and present problems in heating and ventilation. J: R. Allen. Am Soc Heat & V E 19:53-62 '13
Downward ventilation in a Rockford. Ill..

& V E 19:53-62 '13

Downward ventilation in a Rockford, Ill., schoolhouse; with discussion. C. E. Beery, il plans Am Soc Heat & V E 19:63-81 '13

Edison phonograph shop. C. E. Daniel, plans Heat & Ven 12:13-18 Ap '15

Engineers show need of good ventilation. Metal Work 83:203-7+ Ja 29 '15

Factory building equipped with outside air ducts, il plans Heat & Ven 12:19-25 Ap '15

Factory with down ventilation through columns, il plan Eng N 73:1012-13 My 27 '15

Fans for ventilating work. C. L. Hubbard. Eng M 48:385-92 D '14; Same. Eng & Contr 43: 197-9 Mr 3 '15

Fresh air and eating. Sci Am 113:92 Jl 31 '15 Future developments in heating and ventila-tion. A. H. Barker. Power 41:897-8 Je 29 '15; Abstract. Am Soc M E J 37:490-1 Ag '15

Heating and ventilating an office building by electricity: Hydraulic power co.'s plant at Niagara Falls. C. F. Herington. il diags plan Heat & Ven 12:13-22 Je '15

Heating and ventilating conditions in large office building. C. E. A. Winslow and G. F. Maglott. Heat & Ven 12:26-31 F '15

Heating and ventilating industrial plant. J. H. O'Brien, il Metal Work 83:319-22 F 26 '15 Heating and ventilating plant for the Missouri state capitol; reversible system of air supply for house and senate chambers, il diags plans Heat & Ven 12:13-21 My '15 Heating and ventilating practice in Sweden. H. Theorell, Am Soc Heat & V E 20:94-7 '14 Heating and ventilating stables and garages. C: L. Hubbard, diags Dom Eng 72:168-70 Ag 7 '15

7 '15
Heating and ventilation of main floor and vestibules of the Lord & Taylor store. J. Graham. diags Dom Eng 72:282-3 S 4 '15
Heating and ventilation of offices and banking rooms. C: L. Hubbard. diags Brickb 23: 307-10 D '14
Horizontal air currents advocated for room ventilation. Heat & Ven 12:48 Ja '15
Hygienic home: facts about ventilation and fresh air. J: B. Todd. Sci Am S 79:74 Ja 30 '15

Illinois chapter discusses kitchen ventilation. Metal Work 83:171 Ja 22 '15 Improved air conditions in a Boston residence.

F. I. Cooper, plan Am Soc Heat & 19:82-8 '13

19:82-8 '13 Kitchen ventilation for a modern hotel: equipment of the Biltmore, New York, il diags plan Heat & Ven 12:13-18 Ja '15 Lecture course on elements of heating. C: A. Fuller. Metal Work 81:129-30, 209, 231-2, 338-9; 82:31-3; 83:574-6, 703-5, Ja 16, 30, F 13, 27, Jl 10 '14, Ap 16, My 14 '15 Modern equipment in Detroit athletic club. diag plan Metal Work 84:73-6 Jl 16 '15 New observations on ventilation. O. W. Griffith. Heat & Ven 12:25-6 N '15 New York state commission on ventilation: high temperatures have marked physiological

New York state commission on ventilation: high temperatures have marked physiological effect. Elec Ry J 44:1330 D 19 '14
Ozone—an aid to factory ventilation. V. D. Greene. diag Eng M 49:517-25 J1 '15
Ozone and its applications. M. W. Franklin. Am Soc Heat & V E 19:128-40 '13
Ozone in ventilation. J. C. Olsen and W: H. Ulrich. Sci Am S 79:34-5 Ja 16 '15
Practical ventilation. C. F. Bennett, Dom Eng 73:232-3 N 20 '15

Progress of heating and ventilating art in the last decade. R. C. Carpenter. Sibley J 30: 51-4 N '15 Public health and sanitary rules. Metal Work 84:465 O 8 '15

Recent developments in ventilation work.

Recent developments in ventilation work. D. D. Kimball. Metal Work 84:494-7 0 15 '15 Reduction or elimination of noise attending the operation of mechanical ventilating machinery. R. W. Pryor, jr. plans Heat & Ven 11:26-9 Ag '14; Same. Iron Age 94:210-11 Jl 23 '14; Same. Metal Work 82:275-6 S 4 '14; Same; with discussion. Am Soc Heat & V E 20:320-9 '14; Discussion. Heat & Ven 11:44-5 N. '14

N '14
Relation of ventilation to bodily health. T: R. Crowder. Metal Work 84:116-17 Jl 23 '15
Report of N. C. G. A. committee on heating, ventilation and refrigeration. G: S. Barrows. Am Gas Light J 101:411 D 28 '14
Report on work of ventilation division of the Chicago health department for 1913. E. V. Hill. diag Am Soc Heat & V E 20:57-73 '14
Theory and practice of heating and ventilating in France. G. Debesson. diags Am Soc Heat & V E 20:124-50 '14
Theory of ventilation. Metal Work 84:453 O 8 '15

'15 Ventilating and cooling a church, plan Bldg Age 37:61-2 S '15 Ventilating and cooling church edifice. plan Metal Work 82:757-8 D 11 '14 Ventilating the House of commons. A. P. Patey. Metal Work 83:538 Ap 9 '15 Ventilation and the open window. M. S. Cooley. Am Soc Heat & V E 19:361-3 '13 Ventilation of industrial plants. C. T. Graham-Rogers and W: T. Doyle. Metal Work 83: 283+ F 19 '15; Same. Dom Eng 71:4-5 Ap 3 '15

Ventilation of smoking room. H. N. Oman. Metal Work 83:512-13 Ap 2 '15 Ventilation of telephone and movie booths. R. L. Douglass, il Dom Eng 69:161-2 N 7 '14; Same; with discussion. Am Soc Heat & V E 20:330-6 '14

Ventilation -Continued.

entilation — Continued.
Ventilation standards for factories. Eng & Contr 43:519 Je 9 '15
Ventilation theory and impure air. C. F. Bennett. Metal Work 84:76 Jl 16 '15
Work of the Chicago ventilation commission. il plans Heat & Ven 12:26-31 My '15

il plans Heat & Ven 12:26-31 My '15

\*See also Air conditions; Air flow; Air purification; Air washers; Car ventilation; Chimneys; Cooling; Fans, Mechanical; Heating;
Hospitals—Heating and ventilation; Hotels—
Heating and ventilation; Humidity; Mine
ventilation; Schoolhouses—Heating and ventilation; Subways—Ventilation; Theaters—
Heating and ventilation; Tunnel ventilation;
Ventilators; also Institute of heating and
ventilating engineers

### Experiments

Experiment in school room ventilation with reduced air supply through individual ducts; with discussion, F: Bass, il Am Soc Heat & V 15 19:328-60 [13]

Experimental plant of the New York state commission on ventilation, il plans Heat & Ven 12:18-26 Mr '15

Experiments arranged by New York ventila-tion commission. Heat & Ven 11:48 D '14

Progress of laboratory experiments with air. F: S. Lee. Metal Work 84:338-9  $\pm$  S 10 115

Recent tests on recirculation of washed air. G. L. Larson, il Metal Work 84:675-7+ N 26 '15; Abstract. Am Soc M E J 37:723-4 D '15

Recirculating of air in a school in Minneapolis. F: Bass. Heat & Ven 12:27-30 Mr '15

Results of physiological and psychological observations during the first year's experiments; abstract. D. D. Kimball and G: T. l'almer. Power 41:177 F 2 '15

## Laws and regulations

General statement of the committee of Am. society of heating and ventilating engineers on compulsory ventilation. Power 41:176-7 F

Legislation for compulsory ventilation; committee report with discussion. Am Soc Heat & V E 19:179-93 '13

Proposed standards for ventilation legislation for motion picture show places; with discussion. Am Soc Heat & V E 19:166-78 '13

Ventilating division of the health department, Chicago, Ill. E. V. Hill. il diags Am Soc Heat & V E 19:412-34 '13

Ventilators
Long Island railroad installs double ventilators.
diag Elec Ry J 46:194 J1 31 '15

Tests of exhaust ventilators on passenger trains. G: L. Fowler. Ry Age 58:1009-12 My 14 '15; Same. Ry Age (Mech ed) 89:235-8 My '15

Venturi formula

Note on the modified venturi formula for flow of gases or vapors. G. B. Upton, Sibley J 29: 90-5 D '14

Venturi meters

pecial Venturi meter for irrigation water measurement. diag Eng & Contr 43:61-2 Ja Special

Venturi meter for sewage measurement, C: G. Richardson, il diags Boston Soc C E J 1:429-37 O '14

Veratrine

Veratrine and some of its derivatives. G: B. Frankforter and W. Kritchevsky. Am Chem Soc J 37:2567-9 N '15

Vessels, See Steamboats

Viaducts. See Bridges

Vibrations

Explorations over the vibrating surfaces of telephonic diaphragms under simple impressed tones. A. E. Kennelly and H. O. Taylor. Elec W 66:463 Ag 28 '15

Measuring shocks of vehicles and vibration of buildings: a means for investigating impor-tant traffic problems. A. Boyer-Guillon. il diags Sci Am S 78:364-5 D 5 14

See also Automobiles-Vibration

### Victoria, British Columbia

Water supply

Costs and special features of the new water supply of Victoria, British Columbia. B. Ehle. il diags Eng Rec 72:406-10 O 2 15

Sooke lake water-supply for Victoria. C. H. Rust. Eng N 74:996-7 N 18 '15

Ten and three-quarters miles of 36-inch riveted-steel pressure line built on Sooke work. B. Ehle. il plan Eng Rec 72:564-5 N 6 '15

Virgin country renders concrete pipe line con-struction difficult. B. Ehle. il diags plan Eng Rec 72:507-10 O 23 '15

Villa Madama, Rome, See Rome (city)-Archi-

Villas. See Architecture, Domestic-Designs and plans

Vincennes, Indiana

### Sanitary affairs

Sanitary survey of Vincennes. Eng & Contr 43:268 Mr 24 '15

Utility of sulfurous acid and pure yeast in cider vinegar manufacture. W. V. Cruess, J. R. Zion and A. V. Sifredi. J Ind & Eng Chem 7:324-5 Ap '15

### Testing

Apparatus for determining quality and intensity of violin tones. D. Richardson, Sci Am 113:384+ O 30 '15

Violin playing
Device for the simultaneous playing of violin
and piano, il Sci Am 113:471 N 27 '15

Virginia

## Capitol

Thomas Jefferson and the first monument of the classical revival in America. F. Kimball. il Am Inst Arch J 3:370-81, 421-34, 473-91 S-N 15

### Industries and resources

Oriskany iron ores of Virginia. C. M. Weld. maps Econ Geol 10:399-421 Jl '15

Virginia power company
Cabin Creek plant, il diags plan map Elec W
66:239-44 Jl 31 '15
One boiler room instead of fifty; Cabin Creek
plant, il diags Elec W 66:286-91 Ag 7 '15

Viscometers

Comparison viscometer for oils. diag Am Gas Light J 103:301 N 8 '15
Design of an absolute viscometer for engineering testing of oils. G. B. Upton. Sibley J 29:262-9 My '15
New direct-reading viscosimeter. R. F. Mac-Michael. il J Ind & Eng Chem 7:961-3 N '15; Same. Met & Chem Eng 13:767-9 O 15 '15

Conductivity and viscosity of solutions of electrolytes in formamid. P. B. Davis, W. S. Putnam and H. C. Jones. il diags J Fr Inst 180:567-601 N '15

Theory of lubrication. L. Ubbelohde. Gen Elec R 18:966-72, 1074-81, 1118-21 O-D '15

Viscosities of binary mixtures of the associated liquids, water, formic acid and acetic acid. P. E. Davis and H. C. Jones. Am Chem Soc J. 37:1194-8 My '15

Viscosity of porcelain bodies high in feldspar. A. V. Bleininger and C. S. Kinnison. U S Bur Stand Tech Pa 50:1-7 '15; Abstract. Metal Work 84:526 O 22 '15

See also Viscometers

See also Viscometers

Visibility, See Optics

Visible speech

Visible speech; eye seeing and the rule meas-uring the difference between sounds. A. L. Kroeber, il diags Sci Am 112:471 My 22 '15

Vitamines
Beriberi-preventing vitamines. W. P. Chamberlain. Sci Am 113:379 O 30 '15

berlain. Sci Am 12:379 O 30 '15

Vitamines and cooking. D. McCaskey. Sci Am 113:379 O 30 '15

Vitamines —Continued. Vitamines, and their importance for the main-tenance of health. Dr. Reinhardt. Sci Am 113:238-9 S 11 '15

Vitreosil. See Silica, Fused

Vitrification, See Clay products

Vladivostok, Siberia Vladivostok open all the year. J. B. Caldwell. Sci Am 113:487 D 4 '15

Vocational education

Evening courses in retail selling at University of Minnesota. Am Ind 15:18 Ja '15 Learning through doing. Sci Am 112:624 Je 26

Lengthening the educational perspective. L. Galloway, Am Gas Light J 101:386 D 21 '14 National commercial gas association courses, and compulsory education. L. Galloway, Am Gas Light J 103:102-3; Discussion. 103:103, 106-7 Ag 16 '15 Rockford vocational school cooperates with central station in training employees, il Elec R & W Elec'n 67:31 Jl 3 '15

Sec also Industrial education; Professional lucation; Technical education; Trade education; schools

/ocational guidance

Thy vocational guidance. B: C. Gruenberg. Sci Am S 79:275 My 1 '15

Standardizing the art of voice production. F. S. Muckey. Sci Am S 79:137-8 F 27 '15 /olatile oils. See Essential oils

/olcanic steam, See Steam, Natural

Diary of Kilauea. il Sci Am S 79:36 Ja 16 '15 Notes from a volcano laboratory; personal documents in the case of Kilauea and Mauna Loa. T. A. Jaggar, jr. il Sci Am S 80:214-17

Sakurajima eruptions and earthquakes. E. Omori. Sei Am S 79:242-3 Ap 17 '15

Sec also Lassen Peak

/oltage regulation

Automatic voltage regulators. W. H. Acker, il diags Elec W 65:127-8 Ja 9 '15 Direct-current three-wire systems. G. Fox. diags Power 41:505-8 Ap 13 '15

diags Fower 41:305-8 Ap 13 '15
Lamp-socket energy economizer, il Elec R & W Elec'n 66:742-3 Ap 17 '15
Regulator for car-lighting circuits, il diags
Elec Ry J 45:851-2 My 1 '15
Schweitzer automatic instantaneous voltage regulator, diag Elec R & W Elec'n 66:271 F

Storage-battery voltage regulation. C. S. Redding. il diags Elec W 65:1134-5 My 1 '15

oltaic arc. See Electric arc

oltameters Oltameters
Complications at the anode in the silver coulometer (voltameter). T. W. Richards and F. O. Anderegg. diag Am Chem Soc J 37: 675-93 Ap '15
Inclusion of electrolyte by the deposit in the silver voltameter. T. W. Richards and F. O. Anderegg. Am Chem Soc J 37:7-23 Ja '15
Studies on the silver voltameter. G. A. Hulett and G. W. Vinal. U S Bur Stand Bul 11:553-70 My 27 '15

Cheap 110-volt alternating-current voltmeter. A. E. Oswald, diag Elec R & W Elec'n 67: 973 N 27 '15 Proper use of ammeter and voltmeter in the plating room. Metal Ind n s 13:67-8 F '15

Voltmeter and ammeter in the plating room. S. E. Huenerfauth, Metal Ind n s 13:71 F '15

Automatic volumeter; abstract. E. G. Hopson. diag Am Soc M E J 37:722-3 D '15

Acid potassium and acid sodium phthalates as standards in acidimetry and alkalimetry. W. S. Hendrixson. Am Chem Soc J 37:2352-9 O '15

Acid ratio: a new method for determining the proteolytic strength of germinated grain in technical analysis. C. A. Nowak. J Ind & Eng Chem 7:858-9 O '15

Arsenious oxide as an alkalimetric standard.
A. W. C. Menzies and F. N. McCarthy. Am
Chem Soc J 37:2021-4 S '15
Determination of ferrous iron in silicates by
titration with dichromate. O. L. Barnebey.
Am Chem Soc J 37:1829-35 Ag '15
Economy and rapidity in copper titrations.
E. A. Slagle. Eng & Min J 99:285 F 6 '15
Electro-titrametric method and its application
to general analytical chemistry. F. H. Hesselink van Suchtelen and A. Itano. Am Chem
Soc J 36:1793-1803 S '14
Ferrocyanide determination of zinc. Eng &

seink van Suchtelen and A. Itano. Am Chem Soc J 36:1793-1803 S '14
Ferrocyanide determination of zinc, Eng & Min J 99:285-6 F 6 '15
Method for the precise standardization of hydrochloric acid solutions. L. W. Andrews, Am Chem Soc J 36:2089-91 O '14
Method for the titration of small amounts of halides. F. C. McLean and D. D. Van Slyke, Am Chem Soc J 37:1128-34 My '15
Rapid analysis of alloys for tin, antimony and arsenic. F. A. Stief, diag J Ind & Eng Chem 7:211-12 Mr '15
Rapid precise standardization of acid solutions. M. Randall and C: C. Scalione. Met & Chem Eng 13:787 N 1 '15
Stanuardization of alkalimetric solutions. F. D. Dodge. J Ind & Eng Chem 7:29-30 Ja '15
Titration of nitrates with ferrous sulfate. F. C. Bowman and W. W. Scott, J Ind & Eng Chem 7:766-9 S '15', Volumetric estimation of titanium by means

Volumetric estimation of titanium by means of ferric chloride, T. R. Ball and G. M. Smith. il Am Chem Soc J 36:1838-43 S '14 Volumetric Fehling method using a new indicator. A. M. Breckler. J Ind & Eng Chem 7:37-8 Ja '15

Volumetric apparatus
Portable titrating table. R. E. Ozias, il diag
J Ind & Eng Chem 7:872-3 O '15
Testing of glass volumetric apparatus. diags
U S Bur Stand Circ 9:1-31 '14
Titration table. R. S. Potter and R. S. Snyder,
il J Ind & Eng Chem 7:45-6 Ja '15 See also Pipets

Voting by electrical apparatus, diags Elec R & W Elec'n 66:744-5 Ap 17 '15

Voting machines

Voting machines in Wisconsin. F. H. Mac-Gregor. Munic J 39:658 O 28 '15

Vulcanized fiber Vulcanized fibre. C: Almy, jr. il Met & Chem Eng 13:746-7 O 15 '15

Wabash railroad

Reorganization plan. Ry Age 58:978 My 7 '15 Statistics. map Ry Age 58:256-7 F 12 '15

Waco, Texas

Water supply

Water sedimentation, coagulation and mechanical filtration at Waco, Texas. il Eng N 72: 1162-3 D 10 '14

Census of employees and wages. Elec W 65:600 Mr 6 '15

Mr 6 '15
Construction superintendent favors paying off in cash. Eng Rec 71:245-6 F '15
Fifteen years' wage increases in the Canadian northwest. Eng N 73:395 F 25 '15
Handling employes so as to minimize costs.
A. M. Burroughs. Metal Work 82:790-3+ D 18

Investigation of wages paid by Pullman company. Ry Age 58:786 Ap 9 '15
Iron and steel wages and hours. Iron Age 95: 1265 Je 3 '15
Methods of adjusting mining rates. L. Gluck. Colliery 35:349-53 F '15

Reduced sheet and tin mill wages. Iron Age 95:360 F 11 '15

Rising wage differential and the cure. Ry Age 58:1429 Je 18 '15

Seven per cent wage reduction granted; British Columbia electric railway, ltd. Elec Ry J 46: 392-4 S 4 '15

Wages - Continued

ages \*\*Continued\*\*
Wage systems in the railroad repair shop.
E. Cordeal, Eng M 49:51-7 Ap '15
Wage systems of scientific management. Ind
Eng 15:45-50 F '15
Wages and hours of labor in the iron and steel
industry, table Mach 21:954 Ag '15

See also Bonus system; Labor and laboring classes; Minimum wage; Piece work; Profit

Walking excavator
Dredge walks along over trench, il Eng N 74:
912 N 11 '15
Excavating machine that walks, il diag Sci
Am 113:68 Jl 17 '15

Wall decoration. See Mural painting and decora-

Walls

Valls
Dry masonry walls for highway embarkments.
il Eng Rec 70:687 D 26 '14
Lateral strength of hollow-tile walls; tests at St. Louis. il diags Eng N 73:428-9 Mr 4 '15
Length of life of walls of mortar on metal lath.
W. E. Belcher, Eng Rec 71:754 Je 12 '15
Old wall used as coffer-dam fails at Louisville. il Eng N 74:764-5 O 14 '15
Stucco board vs. standard built walls. il Bldg
Age 37:67-8 Ap '15
See also Building; Dams; Foundations;
Mural painting and decoration; Partitions;
Plaster and plastering; Retaining walls; Sea
walls

walls

Walls, Concrete
Curbing the sea at Galveston. H: M. Robert.
il Sci Am 113:268 S 25 '15
Field methods in concrete construction—wall
forms: design and construction. J. Cochran.
Concrete Cem 7:23-6 Jl '15
Model target ranges in Belgium. Sci Am S
79:165 Mr 13 '15
Model for insulated concrete walls, diags Con-

79:165 Mr 13 '15
Molds for insulated concrete walls, diags Concrete Cem 7:88 Ag '15
New type of concrete wall construction, diag Concrete Cem 6:268 My '15
Subway undercrossing walls concreted from the top down, il diag Eng Rec 72:25-6 Jl 3

Walton, Charles S.
Residence of Charles S. Walton, Esq. R. D.
Murray. Arch Rec 38:501-23 N '15

Campaigning in winter, Sci Am 111:461 D 5 '14 Disease in warfare, Sci Am 112:468 My 22 '15 Eugenics and war. Sci Am S 79:230 Ap 10 '15 Lessons of the present war from a technical point of view, H. Maxim, Sci Am 112:453 My

Nerves and the war. A. Eulenburg. Sci Am 112:214 Mr 6 '15
Steam or electric railways in time of war. Engineer 119:142 F 5 '15
War then and now; comparison between Civil war and European war. I. R. Sherwood. Sci Am 112:430 My 8 '15
Wars, ancient and modern. Sci Am 113:226 S 11 '15

See also Aeronautics, Military; Automobiles in war; Electricity in war; International law; Military art and science; and other headings beginning Military; Motorcycles in war; Peace; Railroads in war; Submarine warfare; Transportation, Military; War games; War materials; Wireless telegraph in war; also materials; Wireless European war, 1914-

## Relief of sick and wounded

Exposition of military sanitation; showing how the sick and wounded are cared for. A. Gradenwitz. il Sci Am S 79:316-17 My 15 '15 Letters from the firing line: the care of the wounded. X. Sager. il Sci Am 111:510+ D 19

See also Ambulances; Hospital cars; Hospital trains; Surgery, Military; also European war—Medical and sanitary affairs; European war—Relief work

War, Cost of
Prodigious war wastes in minor items. Eng &
Min J 100:898 N 27 '15
War and its bearing upon contracts and trade,
A. Del Mar. Eng M 50:23 O '15

War, Maritime

See also Lusitania (steamship); Submarine warfare

War cripples. See Cripples

War games

War game and how it is played. il Sci Am 111: 470-1 D 5.14

War materials
Connecticut to Poland by way of the Pacific;
how munitions are shipped to Russia across
Asia. H: H. Suplee. map Sci Am 113:115 Ag

Government and work on munitions. Iron Age 96:728-9 S 23 '15
Government plant for making munitions. H. H. Campbell. Iron Age 96:910-11 O 14 '15
Making munitions of war in England. Sci Am S 80:131 Ag 28 '15
Making of war munitions at private works; government seeks data. Iron Age 96:358 Ag

Mobilisation of war raw materials in Germany, Engineer 119:307-8 Mr 26 '15; Same, Sci Am S 80:30 Jl 10 '15 Munition metals. H. C. H. Carpenter. Sci Am S 80:262-3 O 23 '15; Abstract. Eng M 50:112-13 O '15

Munitions of war bill introduced in the House of Commons on June 23. Engineer 120:24-5 Jl 2 15

Naval and military exhibit of the National security league. il Sci Am 112:626 Je 26 '15 Selling arms and ammunition. Sci Am 113:154 Ag 21 '15 Terms of contracts for war munitions. Iron Age 96:635-6 S 16 '15

Use of aluminium in war. N. Flamel. Sci Am

War material and invention. Engineer 119:605-6

War order activity in New England. Iron Age (6):201-3 Jl 22 '15
War orders and American industry. Eng M 49; 4S1-5 Jl '15
War rushes French plants; automobile factories working 24 hours a day on ammunition, aeroplane and military supplies. W. F. Bradley, il Automobile 32:1013-15+ Je 10 '15
War significance of cotton. Sci Am 113:38 Jl 10 '15

See also Ammunition; Automobiles in war; Cotton as contraband of war; European war—Commercial and financial aspects; European war—Military equipment; Motorcycles in war; Shells; Shrapnel shells

War monuments. See Monuments

War news Mobilizing news. C: E. Crane. il Sci Am 112: 134-5 F 6 '15

War orders. See War materials War ships. See Warships

Ware, William Robert, 1832-1915 Sketch. A. D. F. Hamlin, por Am Inst Arch J 3:382-6 S '15 Warehouses

Carnegie steel co. warehouse opens at Boston il plan Iron Tr R 56:620-2 Mr 25 '15 Carnegie steel company's Boston warehouse at Allston, Mass. il Iron Age 95:670-2 Mr 2

Concrete warehouses and terminal plant a New Orleans will cover 100 acres. il plan Eng Rec 71:402-3 Mr 27 '15 Concreting plant for large Chicago warehouse il plans Eng N 74:289-91 Ag 12 '15

Cotton warehouse and terminal at leans. diag Eng N 73:1217 Je 24'15

Design and construction of Midland warehouse Chicago, il diags plans Eng & Contr 44:182-S 8 '15

Electrical installation in Seattle warehouse Elec R & W Elec'n 67:895-6 N 13 '15

Electricity in large steel warehouses, il Ele R & W Elec'n 67:463-5 S 11 '15

Galveston Carnegie warehouse. E. C. K berg. il Iron Tr R 56:169-70+ Ja 21 '15

New steel and concrete structure to furnis nearly sixteen acres of floor space; Binghar warehouse in Cleveland. diags plan Eng Re 72:356-7 S 18 '15

Warehouses -- Continued.

Varehouses — Continued.

New steel warehouse of Joseph T. Ryerson & son, Jersey City, il Iron Age 96:298-9 Ag 5 15; Iron Tr R 57:279-1 Ag 5 145

Paving for piers, warehouses and garages, plan Eng N 73:952-4 My 13 '15

Remodeled warehouse at St. Louis, il Iron Tr R 57:99-1 Jl 8 '15

Reservoir effects in freight movements, R. H. Rogers, il Int Marine Eng 20:107-9 Mr '15

Retailing steel mill products, il plan Iron Tr R 56:665-71 Ja 7 '15

River-front approach to a Chicago building the

R 56:65-71 Ja 7 7 15
River-front approach to a Chicago building, il
Eng N 74:817 O 28 '15
Structural features of a reinforced concrete
combined storage warehouse and office
building in Seattle, diags Eng & Contr 42:
446-51 N 11 '14
Warehouse business requires speed, il Iron Tr

R 57:578-9 8 23 '15 Wenter & Drechsler fireproof storage warehouse, diags Brickb 23:294 D '14

See also Freight houses; Grain elevators

Warm air furnaces. See Furnaces, Hot air

Warm air heating and ventilating association, National. See National warm air heating and ventilating association

Warping machines
Creel for warping machines, il Textile World
50:186-7 N '15

Warren brothers co., Boston, Mass. Organization and work of a national paving company. il Eng N 73:712-16 Ap 15 '15

Warrenite. See Pavements. Bitulithic

Warshins

Varships
Applicability of electrical propulsion to battle-ships, together with the experience gained with it on the Jupiter: abstract. S. M. Robinson. Int Marine Eng 20:19-21 Ja '15
Application of electricity in naval warfare. H. L. Hibbard. il Sibley J 29:251-61 My '15
Are obsolete battleships obsolete? Sci Am 112:356 Ap 17 '15
Coaling United States warships. il diag Sci Am S 79:276-7 My 1 '15
Electrical equipment of a battleship. Elec R W Elec'n 66:671-2 Ap 10 '15
Electrical propulsion on battleships. Int Marine Eng 20:3 Ja '15
Fighting efficiency of the "Iron Duke" and the "Kaiser." S. J. Mesher. Sci Am 113:79 Jl 24 '15

Formula for calculating the tactical value of fighting ships. A. Given. Sci Am 112:50 Ja 9

Laumching data for a battleship: abstract.
J: G. Tawresey. Int Marine Eng 20:9-11 Ja
15

'15
Naval lessons of the war, H, M. Kennard, Sci Am 112:473 My 22 '15
"Pennsylvania" and "Queen Elizabeth." C: B. Gary, Sci Am 113:79 11 24 '15
Refueling warships at sea: abstract. S. Miller. Int Marine Eng 20:17-18 Ja '15
Revolutionizing naval construction. Sci Am 113:286 O 2 '15

Revolutionizing naval construction. Sci Am 113:256 O 2 '15
Super-battle-cruiser. Sci Am 112:510 Je 5 '15
Turbine-electric propulsion for battleships. Eng Rec 71:607 My 15 '15
Warship types of the future. W: B. Chalfant. Sci Am 113:321 O 9 '15
Warships of the future. Engineer 119:359-60
Ap 9 '15

Ap 3 13 hich is the most powerful battleship? J. B. Walker. il diags Sci Am 113:80-1 Jl 24 '15 Which See also Armor plate; Naval guns; Navies; Submarine boats; Tenders, Naval; Torpedo

boat destroyers

Argentina

Electrical equipment of the Argentine battle-ship Moreno. H. A. Hornor, il diags Am Inst E E Pro 33:1543-68 O '14; Summary. Elec W 64:752-3 O 17 '14; Discussion. Am Inst E E Pro 34:679-94 Ap '15

### Austria

Austrian gun boats on the Danube. F: von Pilis. il Sci Am 113:299 O 2 '15

### France

French battleships Bretagne and Provence. il Int Marine Eng 20:198-9 My '15

New French battleship Tourville, M. K. Bar-nett, il diag Sci Am 113:45 Jl 10 '15 New French battleships: trials of the Paris and France—launch of the Gascogne, Normandie and Flandre, il Int Marine Eng 19:551-3 D '14

### Great Britain

Loss of the pre-dreadnought Bulwark. il Sci Am 111:489 D 12 '14 Super-dreadnought Queen Elizabeth at the Dardanelles, plan Sci Am S 79:299 My 8 '15

### United States

Keel of first electrically propelled battleship laid. Elec W 66:844 O 16 '15
Largest battleship launched; the U. S. S. Pennsylvania. Eng N 73:556 Mr 18 '15
Launching of the battleship Arizona. G. H. Barber. il diags Int Marine Eng 20:334-6 Ag

Reduction gears on the Pennsylvania, il diags Int Marine Eng 20:339-40 Ag '15 United States battleship California and class. Sci Am 113:63 Jl 17 '15 United States dreadnought Nevada, il Sci Am 113:424 N 13 '15 Warship construction in navy yards. P. F. Peterson, Int Marine Eng 20:178-9 Ap '15 Caphyron above Sea Warship construction in Part of the Peterson of the Pe Washburn shops. See Worcester polytechnic in-

stitute Washed metal. H: D. Hibbard. il plan Am Inst Min E Bul 108:2387-94 D '15

Washing, See Laundry

Washing See Laundry
Washing machines, Electric
Electric washer for use in stationary tubs.
il Elec R & W Elec'n 67:250 Ag 7 '15
Electric washer with inclosed gearing, il Elec
W 66:488 Ag 28 '15
Electric washer with vacuum agitator, il Elec
W 66:424 Ag 21 '15
Horton electric washer, il Elec R & W Elec'n
67:587-8 S 25 '15
Johnson electric washer, il Elec R & W
Elec'n 66:744 Ap 17 '15
New Dodge & Zuill electric vacuum washer,
Elec R & W Elec'n 66:740-1 Ap 17 '15
White washing machine, il Elec R & W Elec'n

White washing machine. il Elec R & W Elec'n 67:442-3 S 4 '15

Washington, D. C. McKim and the park commission. G. Brown. il plan Arch Rec 38:681-9 D '15

Washington plan and its progress, W. W. Harts. Am Inst Arch J 3:241-2 Je '15 See also Ellen Wilson memorial homes

## Architecture

New building for the Bureau of engraving and printing. il diags Arch & Bldg 46:463-70 D '14 New post office. il Arch & Bldg 46:423-9 N '14

Old City Hall, Washington, D. C. H. F. Cun-ningham, il diag Arch Rec 37:268-73 Mr '15

## National museum

Mineral-industry exhibit at the National mu-seum. C. G. Gilbert. il Eng & Min J 100:470-2 S 18 '15

## Streets

Analyses of asphaltic concrete and asphalt block laid in 1914. Eng & Contr 43:43 Ja 13

Bituminous concrete pavement construction in Washington. M. Brooke. il Eng & Contr 43:325-6 Ap 7'15

Records of Washington's street cleaning. Munic J 38:654-5 My 13 '15

Water supply

Vater waste surveys in the District of Columbia, P. Lanham, il Eng & Contr 43: 275-6 Mr 24 '15

## Washington (state)

## Industries and resources

Possible occurrence of oil and gas fields in Washington. C: E. Weaver. Am Inst Min E Bul 103:1419-27 Jl '15; Discussion. 108:2431-3 D '15

Washington university, St. Louis, Missouri Washington university, St. Louis, G. Study, il plan Arch Rec 37:64-75 Ja '15

Waste. See Trade waste; Waste heat; Waste products, and references under that subject; Water waste

Waste fuel

Coke recovered from the cupola dump. W. J. Keep, Iron Tr R 56:382+ F 18 '15 Firing low-grade fuel and wastes. S. H. Bun-nell. Power 41:375 Mr 16 '15

See also Fuel economy; Sawdust as fuel

Waste heat

Vaste heat

Exhaust-gas heated boiler, G. Moore, diag Power 41:893 Je 29 '15

Heat energy from the Bessemer process, G. Butz. Iron Age 95:618-19 Mr 18 '15

Heater utilizing gas engine exhaust, diag Iron Age 96:413 Ag 19 '15; Same. Metal Work 84: 317 S 3 '15; Same cond. Ind Eng 15:89 S '15

How to make steam from slag. W. L. Johnson, diags Iron Tr R 55:1139-40 D 17 '14

Recovery of heat losses in internal combustion engines; abstract, J. B. Merriam, diag Am Soc M E J 37:295-6 My '15

Reverberatory waste-heat boilers. L. Duncan, il diag Eng & Min J 99:152-3 Ja 16 '15

Utilization of waste heat for the generation of electrical energy. H. Hobson, diag Inst E E J 53:N4-8 Je 15 '15

Utilizing waste heat in a drop forge shop; hot

electrical energy. H. Hobson, diag first E B J 55:184+8 Je 15-715
Utilizing waste heat in a drop forge shop; hot gases from furnaces used to generate steam, il diags plan Iron Age 95:45-7 Ja 7-715
Waste-heat boilers. O. Monnett, diags Power 41:196-7 F 9-715; Same. Eng & Min J 99: 355-9 F 20-715
Waste-heat boilers at Chrome, N. J. C. L. Brower, il diags Eng & Min J 99:892-5 My 22

Waste-heat boilers in steel plants, C. J. Bacon, diags Iron Age 95:1349-52 Je 17 '15; Abstract, Iron Tr R 56:1123-4 Je 3 '15; Abstract, Power

Waste heat to stimulate plant growth. Sci Am 113:445 N 20 '15

Sec also Exhaust steam

Waste metal. See Metal waste; Scrap metal

Waste paper Where waste newspapers go. Sci Am 111:471 D

Waste products

Vaste products
Baling waste paper, shavings and excelsior.
B. J. Yungbluth. Elec Ry J 45:239 Ja 30 '15
Coal gas residuals—Feld process. F. H. Wagner. Am Gas Inst Pro 9:pt 1, 340-61 '14; Same cond. Am Gas Light J 101:305-9 N 16 '14; Same cond. Met & Chem Eng 12:696-702 N '14; Same cond. Sci Am S 80:316-19 N 13 '15; Discussion Am Cos Inst Pro 6:pt 1, 181 14; Same cond. Sci Am S 300 9:pt 1, 15; Discussion. Am Gas Inst Pro 9:pt 1,

Experience gained in the treatment of the wastes from the scouring of wool. H. R. Crohurst and A. D. Weston. Eng & Contr 44: 270-6 N 10 '15
Garbage and rubbish disposal in Los Angeles. S. C. Simons. il plan Munic J 38:799-803 Je 10 '15

Gas producers with by-product recovery, A. H. Lymn. il diags Am Soc M E J 37:253-66 My

Making fuel out of garbage. W. D. Hornaday. il Munic Eng 48:304-5 My '15
Modern reclamation plant and scrap yard. Ry R 57:281-4 Ag 2 15
Power with by-product recovery. T. R. Wollaston. Engineer 119:326-7 Ap 2 '15; Same. Sci Am S 80:42-3 Jl 17 '15

Pulp from cotton stalks. Sei Am 113:482 D 4 '15 Railway storekeepers' association: committee report. Ry Age 58:1039-41 My 21 '15

Reburning of lime from alkali waste and other forms of precipitated carbonate of lime. R: K. Meade. diag Met & Chem Eng 13:289-90 My '15

Reclaimed rubber. Engineer 120:428-9 N 5 '15 Utilization of cotton waste by German and Austrian methods. F. Nasmith, Textile World 49:sup251+ My '15

Nee also Blast furnace gas; Coke oven gas; Cotton waste; Fish waste; Flue dust; Metal waste; Refuse and refuse disposal; Scrap metal; Sewage sludge; Slag; Smelter fumes; Tar; Trade waste; Waste fuel; Waste paper; Wood ashes; Wood waste

Waste removal Exhaust fan ratings and pipe diameters. Metal Work 83:721-2 My 21 '15

See also Dust removal

Watch springs Watch spring testing apparatus, il Sci Am 111:494 D 12 '14

Watches

Electrical revolution counter and stopwatch, il Elec W 66:1105 N 13 '15 Lancaster's experience with time-inspection system. R. B. Hull. Elec Ry J 46:1034-5 N

Use and care of a watch. Sci Am S 79:233 Ap Watch standards. A. J. Boardman. Elec Ry J

46:874-5 O 23 See also Watch springs

Testing

Certified watches; a laboratory for testing watches at the Bureau of standards. L. W: Thavis. il Sci Am 113:83 Jl 24 '15 Measurement of time and tests of timepieces. pl U S Bur Stand Circ 51:1-39 '14

Cater Chlorides in oil-field waters. C. W. Washburne. Am Inst Min E Bul 87:375-81 Mr '14; Discussion. 100:825-30 Ap '15 Density and volume of water; table. F. R. Low. Power 42:542-3 O 19 '15 Effect of the mineral content of water on canned foods. H. L. Huenink and E: Bartow. J Ind & Eng Chem 7:495-6 Je '15 Water

See also Feed water; Hydraulic engineering; Hydraulics; Ice; Mine water; Mineral waters; Rain; Rivers; Sea water; Springs; Steam; Water supply, and other headings beginning Water; Waterways; Waves; Wells

Analysis

Analysis

Chemical standards for the hygienic purity of public water supplies in Montana, W. M. Cobleigh. Eng & Contr 42:178 Ag 19 '14

Contributions of the chemist to the potable water industry, W: P. Mason. J Ind & Eng Chem 7:289-90 Ap '15

Determination of gases dissolved in waters and effluents. A. A. Swanson and G. A. Hulett. diags Am Chem Soc J 37:2490-500 N '15.

Determination of sulfates in water by benzi-dine hydrochloride, F. W. Bruckmiller, J Ind & Eng Chem 7:600-2 JI '15 Examination of drinking water on railway trains. E: Bartow. Am Water Works Assn Examination of drinking water on railway trains. E: Bartow. Am Water Works Assn J 2:74-82 Mr '15
Laboratory control of water supplies. E: Bartow. il diags plan Am Water Works Assn J 1:720-6 D '14
Ortho-tolidin test for free chlorine. W. F. Monfort. Am Water Works Assn J 1:734-6 D

Perchloric method of determining potassium. C. Scholl. Am Chem Soc J 36:2085-9 O '14
Permanent cotton disc sediment records for water and sewage. G: C. Whipple and J: W. M. Bunker. Eng & Contr 42:420 O 28 '14
Use of silver nitrate as a testing agent. Int Marine Eng 20:85 F '15
Water analysis and the nitrogen content of water. W: M. Booth. Am Water Works Assn J 2:61-4 Mr '15

Bacteriology

Although chlorinated, B. coli increase in number. H. E. Jordan. Eng Rec 71:621-2 My 15

Bacteriological standard for drinking water on common carriers. Eng Rec 70:617-18 D 5 '14; Eng N 72:1293 D 17 '14; Munic J 37:924 D 24 '14; Eng & Contr 48:77 Ja 27 '15; Am Water Works Assn J 2:67-73 Mr '15

Biochemical and engineering aspects of sani-tary water supply. G: W. Fuller. J Fr Inst 180:17-61 Jl '15

Columbus experts determine B. coli vagaries. Eng Rec 72:161-2 Ag 7 '15

Culture media employed for the bacteriological examination of water. E. M. Chamot and H. W. Redfield. Am Chem Soc J 37:1606-30 Je '15

Water-Bacteriology -Continued

Vater—Bacteriology—Continued
 Culture media employed for the bacteriological examination of water; lactose-peptone media.
 E. M. Chamot and C. M. Sherwood. Am Chem Soc J 37:1949-59 Ag '15
 Incubator for testing water-chlorination results at Hudson Falls, N. Y. M. F. Tiernan. Eng N. 72:1221, D. 17, 14

Object and limitations of bacteriological examination of water. W. H. Frost. Eng & Contr. 42:250 S 9 114

Stripping water-works reservoirs. A. Hazen and G. C. Whipple. Eng N 73:858-60 My 6 '15 Studies on the culture media employed for the Studies on the culture media employed for the bacteriological examination of water: the composition of the gases formed in lactose-peptone fermentation tubes, E. M. Chamot, C. M. Sherwood, and R. C. Lowary. diags Am Chem Soc J 37:2198-204 S '15 Water-borne typhoid fever epidemic at Healdsburg, Cal. W. A. Sawyer. Eng & Contr 44: 179-80 S 8 '15

Water, Distilled
Distillation of water, G. W. McKee, il Am
Gas Light J 102:404-7+ Je 28 '15
Studies on water drinking; intestinal putrefaction as influenced by the ingestion of
softened and distilled waters, C. P. Sherwin
and P. B. Hawk, Am Chem Soc J 36:1779-85
Ag '14

Ag '14
Studies on water drinking; the relation between water ingestion and the ammonia, phosphate, chloride and acid excretion. D. W. Wilson and P. B. Hawk. Am Chem Soc J 36:1774-9 Ag '14

Water, Underground
Delusions about underground water, Sci Am
113:408 N 6 '15

See also Mine water; Springs; Wells

Water aeration

Areation Aseration Advantage and the new water purification plant at Miraflores, Canal Zone, G: M. Wells, Eng & Contr 42:489-90 N 18 '14

Temporary water aërator at the Kensico reservoir, W. F. Smith, il diags Eng N 73: 768-9 Ap 22 '15

Water birds

Conserving onserving the waterfowl. A. A. Allen. Am For 21:1047-8 N '15

Water closets

Flushing valve design and installation. diags Metal Work 82:603-5, 710-11; 83:119-21, 157-9 N 6, 27 '14, Ja 15-22 '15

Local venting of plumbing fixtures. J. Graham. diags Dom Eng 71:60-2, 152-3 Ap 17, My

Water Vater closet vent fittings. il Dom Eng 72: 145 Jl 31 '15

See also Toilet rooms

Water columns

Piping water columns. L. Marier. il Power 42: 727 N 23'15

Queer action in a water column. F. F. Jorgen-sen. diag Power 41:787-8 Je 8 '15 Safety-first water column, il Power 41:472

Visits of inspector Brown, J. E. Terman, diag Power 42:369-70 S 14 '15

Water companies

Example of direct competition between publicly and privately owned water works plants in Tarentum, Pa. L. Hudson. Eng & Contr 44: 162-3 S 1 '15

State regulation of the operation of a small water works in Pennsylvania, Eng & Contr 43:103-4 F 3 '15

See also Water meters

## Law

New Jersey supreme court upholds decision awarding damages for illness contracted from drinking impure water supply. Eng & Contr 43:423-4 My 12 '15

## Public relations

Effective water works publicity measure at Terre Haute. Eng & Contr 44:161-2 S 1 '15 Water works publicity measures employed at Terre Haute, Indiana. D. R. Gwinn. Eng & Contr 43:396-7 My 5 '15

Water conduits

Arched reinforced-concrete conduits designed by the theory of least work, W. M. Smith, Eng Rec 71:648-52 My 22 '15; Discussion. 71: 753 Je 12 '15

Constructing a 70-mi, water conduit in Alaska. H. H. Hall. Eng N 74:223-4 Jl 29 '15; Same. Eng & Min J 100:760-1 N 6 '15 Construction of the Sooke gravity flow line at Victoria, B. C. il Concrete Cem 6:299-300 Je

Design and methods and cost of constructing the Los Angeles city trunk line, connecting aqueduct to distribution system. B. A. Heinly. il diags Eng & Contr 43:390-4 My 5

Design features of Cottonwood conduit and new concrete settling basin at San Diego, diags Eng & Contr 43:136-8 F 10 '15 Fall River mills will benefit by \$3,000,000 water and sewerage project, diag Eng Rec 72:501-3 O 23 '15

O 23 '15

Hydraulics of irrigation, drainage, and other channels. L: Schmeer. Eng & Contr 42:28490 S 23 '14

New water-conservation scheme at Fall River, Mass. diag Eng N 74:760-1 O 14 '15

Pipe tunnel backfilled through auger holes. il diags Eng Rec 71:715 Je 5 '15

Plan for condensing-water supply for Fall River, Mass. H. S: Knowlton. plan Power 42:643-4 N 9 '15

42:643-4 N 9 15 Reinforced-concrete conduit analysis simplified by theory of displacements. C. S. Whitney. Eng Rec 72:486-8 O 16 '15 Table of circular and horseshoe conduit sections. Eng N 73:1182-3 Je 17 '15

See also Aqueducts; Flumes; Water pipes; Water supply engineering

Water conservation. See Water laws and legislation

Water consumption

Ater consumption
Meters cut Omaha's water consumption 20 per
cent. Eng Rec 71:712 Je 5 '15

Cent. Eng Rec 72:712 Je 5 '15

cent. Eng Rec 71:712 Je 5 '15
New Orleans water consumption.' Munic J 39: 255-6 Ag 19 '15
Procedure at Kalamazoo, Mich., in case of excessive meter registration. Eng & Contr 44:337 N 17 '15
Report of committee on water consumption, American water works association, 1913-1915. Am Water Works Assn J 2:181-99, 280-3 Mr-Je '15

See also Water meters; Water waste

Water cooling. See Cooling towers Water distillation. See Distillation

Water drinking

ter drinking tudies on water drinking; intestinal putre-faction as influenced by the ingestion of softened and distilled waters. C. P. Sher-win and P. B. Hawk. Am Chem Soc J 36: 1779-85 Ag '14 tudies on water drinking; the relation be-Studies on faction as

Studies on tween water ingestion and the ammonia, phosphate, chloride and acid excretion. D. W. Wilson and P. B. Hawk. Am Chem Soc J 36:1774-9 Ag '14

Water flow

Color used in hydraulic tests of power plants. R. Taylor. diags Eng N 74:617-20 S 23 '15

urrent meters for measuring flow in pipes. H. P. Boardman. Eng N 72:1180 D 10 '14

Diagram for estimating flow in channels and conduits. G. D. Fish. Eng N 73:732-4 Ap 15

iaphragm method for the measurement of water in open channels of uniform cross-section. C. R. Weidner, bibliog il Wis U Bul Eng S 8:1-72 no 1 '14; Excerpts. Eng N 72: 532-4 S 10 '14; Eng & Contr 42:414-15 O 28 '14 Diaphragm method for the

Discharge of water through nozzles. F. W. L. Peebles. Eng Rec 70:637 D 12 '14

Experiments on the flow of sand and water through spigots. R. H. Richards and B. Dudley, jr. diags Am Inst Min E Bul 97:67-72 Ja '15; Same cond. Met & Chem Eng 13:120 F '15; Discussion. Am Inst Min E Bul 101:1122-3 My '15

Flow over weirs with imperfect contractions. G: J. Davis, jr. diags plan Wis U Bul Eng S 8:77-145 no 2 '14

Water flow—Continued. Harrison weir-flow recorder, il Eng & Min J 100:844 N 20 '15

J 100:841 X 20 11 Hydraulic jump, in open-channel flow at high velocity; abstract. K. R. Kennison. Am Soc M E J 37:655 N '15 Investigation of flow through four-inch sub-

Investigation of flow through four-inch sub-merged orifices and tubes. L. R. Balch, diags Wis U Bul Eng S 8:151-77 no 3'14 Methods employed in determining hydraulic elements of unlined water tunnel at Rio Janeiro. R. S. Wark, diag Eng & Contr 44: 75-6 Jil 28'15

New type of flow recorder, il Heat & Ven 12:

New type of flow recorder, il Heat & Ven 12: 52-3 Ag 1.5 Recent tests on flow of water acted on by a propeller; abstract. Flamm. Am Soc M E J 37:559 S '15 Recorder for measuring flow over weirs. il Ry Age (Mech ed) 89:433 Ag '15; Elec W 66: 605-6 S 11 '15

St. Louis engineers test filter controllers. diag Eng Rec 72:284-5 S 4 '15

Salt solution test shows turbine efficiency of 93 per cent at Holtwood plant, il diags Eng Rec 71:358-60 Mr 20 '15

Stream gaging by titration; comparative tests of new chemical and standard mechanical methods of gaging stream flow. L. W. Collet, R. Mellet and O. Lütschg, diag plans Eng & Contr 42:270-3 S 16 '14

Testing water-main flow. R. C. Hardman. Eng

N 74:548 () 28 15 Tests of a proportional weir, il Eng N 74: 1018-19 N 25 15

Sec also Hydraulics; Pitometer; Stream flow; Stream measurement; Venturi meters; Water measurement; Weirs

Water gage cocks Water gage cocks. P. R. Duffey, diags Ry Age (Mech ed) 89:136 Mr '15

Water gages

Ater gages
Hydro-chronograph for recording water levels.
il Munic J 39:237-8 Ag 12 '15
Mercury column alarm for standpipes successfully employed at Ripon, Wis. W. E. Haseltine. diag Eng & Contr 43:550-1 Je 23 '15
Pressurlokd water gage. il diags Power 41:157

Reservoir indicating gage. T: K. Lee. diag Power 41:755 Je 1 '15 Safe guard gage glass reflector. il Power 41: \$35 Je 22 '15

Simple water-level indicator, H. K. Wilson, diag Power 42:423-4 S 21 '15

Water level indicator for tanks, diag Iron Age

Water-tank controlling device, plans Power 41:680 My 18 '15; Same, Eng & Min J 99: 905 My 22 '15; Same, Eng & Contr 44:360 N 3 '15

Water gas. See Gas, Water Water gates. See Floodgates

Water hammer

Causes and prevention of water hammer. Elec W 65:1636 Je 19 '15
Draft-tube water-hammer. J. B. Crane. diag Power 41:789-90 Je 8 '15
Temperature change or water hammer—which? W: Roberts. diag Power 42:657 N 9 '15

Water heaters Explosion of a small hot water heater in a garage. il Locomotive 30:170-2 Ap '15

Hotstream gasoline water heater, il Dom Eng 72:350 S 18 '15

Range boiler water heater, il Metal Work 84: 224 Ag 13 '15

See also Electric water heaters; Feed water heaters; Gas water heaters; Hot water supply

Water heating

See also Feed water heating; Hot water supply; Water heaters

Water hemlock (cicuta)
Cicutoxin; the poisonous principle in water
hemlock (cicuta). C. A. Jacobson, il Am
Chem Soc J 37:916-34 Ap '15

Water hyacinth

Removing and utilizing the water hyacinth. Eng N 73:905 My 6 '15

Water in organic compounds
Qualitative test for water by the use of the
acetylene-cuprous chloride reaction. E. R.
Weaver. Am Chem Soc J 36:2462-8 D '14

Water laws and legislation

Recent legislation for water conservation reviewed and criticised, M. Knowles. Eng Rec 72:488-9 O 16 '15

See also Water pollution; Water rights

Water mains. See Water pipes

Electric well-sounding instrument. L. W. Stocker. diags Eng N 73:444-6 Mr 4 '15 Liquid weigher improved. J. W. Loef. diags Power 41:687-8 My 18 '15 Measuring devices for irrigation water tested at the Davis Field laboratory, University of California. diags Eng & Contr 43:248-53 Measuring well-motory. Water measurement

Measuring well-water levels under difficulties. H. W. Keith. diags Eng N 74:1037 N 25 '15 See also Water flow; Water gages; Water meters; Weirs

Water meters

Ater meters, Welfs

// Ater meters
Cincinnati to sell all water by meter in four years. Eng Rec 72:254 Ag 28 '15
Clark water meter coupling yoke. il Eng & Contr 44:154 Ag 25 '15
Compound water meter for accurate measurement of large and small flows. il Eng & Contr 43:525-6 Je 9 '15
Considerations to be borne in mind in purchasing water meters. Eng & Contr 44: 311 O 20 '15
Current meters for measuring flow in pipes. H. P. Boardman. Eng N 72:1180 D 10 '14
Cutaliment of water waste and selection of meters at Milwaukee water works. Eng & Contr 42:176 Ag 19 '14
District heating: velocity steam meters and water meters. S. M. Bushnell and F. B. Orr. il diags Heat & Ven 12:41-2 Mr '15
Experiences in metering the city of Boston.
J. A. McMurray. Eng & Contr 43:425-6 My 12 '15
Experiences of a city of 6,000 population with

Experiences of a city of 6,000 population with water waste, famines, meters and rates. C. J. Renner. Eng & Contr 43:54-6 Ja 20 '15 Improvements in V-notch meter. il Power 41: 807 Je 15 '15

Improvements in V-notch meter, il Power 41: 807 Je 15 '15
Increasing precision in pitometer survey work at Washington, D. C.—meter reading. Eng & Contr 43:26 Ja 13 '15
Laboratory for investigating and testing liquid flow meters of large capacity; abstracts. W. S. Giele, il diag Am Soc M E J 37:165-9 Mr '15; Power 41:69-71 Ja 12 '15; Discussion. Am Soc M E J 37:169-70 Mr '15
Measurements for the household, il U S Bur Stand Circ 55:102-7 '15
Measurements for the household.

Stand Circ 55:102-7 '15
Measuring boiler feed water, diag Elec Ry J
46:284 Ag 14 '15
Meter for recording flow over weirs, il Iron
Age 96:307 Ag 5 '15
Meter maintenance systematized by waterworks department in Milwaukee, il Eng Rec
71:587-8 My 8 '15
Meterage at Pasadena, California. Eng &
Contr 44:359-60 N 3 '15
Meters set in 1914; tabulation. Munic J 38:
554-7 Ap 22 '15
Notes on meterage from various cities. Eng &

Meters set in 1914; tabulation. Munic J 38: 554-7 Ap 22' 115
Notes on meterage from various cities. Eng & Contr 42:209-10 Ag 26' 14
Oscillating piston water meter. il Eng & Contr 44:96-7 Ag 4' 15
Ownership of meters. Am Water Works Assri J 2:555-68 S' 15 Popularizing the water meter at Columbus, O Eng & Contr 44:243-4 S 29' 15
Power of municipalities owning waterworks to compel consumers to install and pay for water meters—court decisions. J: Simpson Munic J 37:920-1 D 24' 14
Pros and cons of private ownership of water meters. Eng & Contr 44:31-2 Ag 4' 15
Question box: Do water meters increase of decrease cost of water supply to consumers Am Water Works Assn J 1:637-8 D' 114
Question box: How is the cost of installation and maintenance of meters borne? Am Water Works Assn J 1:638-48 D' 14
Question box: Over-registration of meters Should meters register cubic feet or gallons Am Water Works Assn J 1:663-8 D' 14

Water meters—Continued.

Question box: Straight line reading meters—are they preferable to clock dial meters? Am Water Works Assn. J. 1:657-62-10 [14]

Question box: What is the average life of a water meter? Am Water Works Assn. J. 1:676-

Recording power plant operations. J. C. Smallwood, il diags Eng M 49:818-36 S '15 Report of committee of American water works

wood. Il diags Eng M 49:818-36 S '15
Report of committee of American water works
association on standard fittings for water
meters. Am Water Works Assn J 2:283-6 Je
'15; Same. Eng & Contr 43:522-3 Je 9 '15
Results of meterage at Columbus, Ohio, with
special reference to restriction of waste in
lawn sprinkling. J. O'Shaughnessy. Eng &
Contr 43:190-1 Mr 3 '15
Shop equipment and motor trucking costs,
meter division of Milwaukee water works.
Eng & Contr 42:334-5 Ap 14 '15
Specifications governing purchase of water
meters of disc type at San Diego, Cal. Eng
& Contr 42:291 S 23 '14
Waste prevention by individual meters versus
district meters. R. O. Wynne-Roberts. Am
Water Works Assn J 2:397-400 Je '15; Same.
Eng & Contr 44:32-3 Jl 14 '15
Water-meter pits, Milwaukee water-works.
diag Eng N 73:1082 Je 3 '15
Water meters in La Grange, Ga. G. H. Sargent. Munic J 39:222 Ag 12 '15
When is a meter a meter and when not a
meter. A. W. Burgess. Dom Eng 73:78-9 O
16 '15

See also Pitometer; Venturi meters; Water

### Repair

Question box: Is it better to maintain a meter repair department, or send meters to the manufacturers? Am Water Works Assn J 1:678-9 D '14

### Testing

Clark water meter tester. il Eng & Contr 44: 154 Ag 25 '15
New rating flume for current meters, Bureau of standards, il Eng N 73:1127 Je 10 '15
Refinements in water meter testing in New York city, F. B. Nelson, Eng & Contr 44: 239 O 27 '15. York city, F. B. Nelson, Eng & Contr 44: 339 O 27 '15
Testing large water meters, il diags Eng N 74:654 S 30 '15

Water pipes
Allowable leakage from cast iron water mains; abstracts. E. C. Bradbury. Eng & Contr 42:499-500 N 25 '14; Eng Rec 70:330-1 S 19 '14; Eng N 72:725 O 8 '14; Munic J 38:251-2 F 25 '15

Argument for the ownership of water services by the utility. M. L. Cooke. Eng & Contr 44:386-7 N 17 '15

Bowl outlets reduce velocities at pipe-line ends, il diag Eng Rec 72:41 Jl 10 '15 Cast-iron pipe makes good record in Galveston storm. A. T. Dickey, il Eng Rec 72:607 N 13 '15

Covering protects large penstocks from freezing; cement-mortar coating supported by special steel frame around pipe and reinforced with wire mesh. H. G. Huber. il diags Eng Rec 71:269 F 27 '15

Data and discussion on leakage from cast iron water mains. J. W. Ivy. Eng & Contr 43: 568-9 Je 30 '15

Data on the life of wooden pipe pertaining to 79 pipe lines. D. C. Henny, tables Eng & Contr 44:127-30 Ag 18 '15; Same. Eng N 74:400-3 Ag 26 '15; Excerpt. Eng Rec 72: 162 Ag 7 '15; Excerpt. Eng & Min J 100:476 S 18 '15

Economic considerations justify wood-stave pipe for water-power penstocks; comparison with steel. R. E. Horton. Eng Rec 71:356-8 Mr 20 '15

Experiences with leadite for jointing cast iron water mains. H: A. Symonds. Eng & Contr 44:247-8 S 29 '15

Experiences with machine banded wooden water pipe in New Hampshire; abstracts. A. W. Dudley, il Eng & Contr 44:223-4 S 22 '15; Munic J 39:471-2 S 23 '15

Field and office methods in connection with the laying and repair of large water mains at San Diego, Calif. W. W. Albin. Eng & Contr 43:26-7 Ja 13 '15 Flexible bronze tubing of the Partridge Island pipe line. il diag map Eng N 73:1167-8 Je 17 '15; Same cond. Am Gas Light J 103:42 Jl

19 '15'
48-inch cast iron force main for Atlantic City, New Jersey. L. Van Gilder. il Am Water Works Assn J 1:704-8 D '14; Same. Eng & Contr 43:77 Ja 27 '15
Good practice in pipe line construction for high-head hydroelectric plants. J. P. Jollyman. Eng & Contr 44:180-1 S 8 '15
How to make good joints in cast iron water mains with leadite. W. C. Hawley. Eng & Contr 44:200-2 S 15 '15; Same cond. (Experiences in calking joints of water mains) Eng Rec 72:326 S 11 '15
Joint details in high-head pipe lines—data on pipe lines throughout the world. L. C. Frohrieb. il Eng & Contr 44:77-8 Jl 28 '15
Locating pipes on water system. C. E. Davis. Metal Work 84:78-9 Jl 16 '15
Longer cast-iron pipe. Eng N 73:898-9 My 6

135 Very Construction of the construction of the control of the co

74:822 O 28 '15
Practical procedure in designing steel penstocks. V. P. Marran. il diags Eng Rec 71:
353-6 Mr 20 '15
Protecting water mains from frost. il Metal
Work 84:101 Jl 23 '15
Question box: Experience with lead or tin lined
iron pipe; comparative efficiency, life and
cost? Am Water Works Assn J 1:648-50 D
'14

Recording the locations of water-main gate valves, map Eng N 73:892-3 My 6 '15
Records of service of cast-iron water pipe, il Eng N 73:487 Mr 11 '15
Rochester, N. Y., effects saving by using odd-diameter pipe. Eng Rec 72:393-4 S 25 '15
Service pipes. Am Water Works Assn J 2:550-3 S '15

Subaqueous pipe taken up and replaced 3 feet lower. E. M. Blake. Eng Rec 72:69-70 Jl 17

Water supply main for Atlantic City, N. J. il Munic Eng 47:445-7 D '14 Water-works service pipes. Eng N 72:1135-6 D

See also Aqueducts; Hot water heating; Pipe joints; Pipe laying; Pipes; Siphons; Thawing; Water flow; Water hammer; Water waste; Waterworks

### Cleaning

Cleaning a city's water mains. J. F. Springer. il Sci Am 112:88 Ja 23 '15 Cleaning a water-supply main at Merced, Calif. il Eng N 74:155 Jl 22 '15 Cleaning of water mains. J. F. Springer. il Munic Eng 48:2-7 Ja '15

Notes on scraping a 15in, trunk main at Bat-ley: abstract. J. C. Barrowclough. Engineer 118:588 D 18 '14

## Cost

Costs of 12- and 16-ft. lengths of cast-iron pipe laid. F. C. Roberts. Eng N 74:641 S 30

Data on comparative cost of maintaining and renewing wooden and steel pipe at Seat-tle. L. B. Youngs. Eng & Contr 44:178-9 S 8 '15

Economy of large water mains with table of comparative cost per foot for different water pipe sizes. N: S. Hill. Eng & Contr 43:374 Ap 28 '15

Waterworks practices and costs. Munic J 39: 148 Jl 29 '15

Water pipes - Continued

Causes of breaks in large water mains in Chicago, C. E. Fitch, diag Eng & Contr 42:416-

13 O 25 '11 Failure of 60-in. water main at Cincinnati by longitudinal compression. J: W. Alvord. diags plan Eng & Contr 43:148-50 F 17 '15; Same cond. Eng Rec 71:588-9 My 8 '15; Ex-cerpt. Eng N 73:407-8 F 25 '15

cerpt. Eng N 73:1407-y F 25 15
Forty-eight inch cast-iron pipe breaks in New
York, il Eng Rec 71:757-8 Je 12 '15
48-in, water-main break, il Eng N 73:1148 Je

48-in. v

10 15 inpact of street cars breaks large water main, il Eng Rec 71:183 F 6 '15 Mishap to Seattle municipal plant, il Elec W 65:902-3 Ap 10 '15 New theory of cast-iron water main breaks, F. M. Aguirre, diags Eng Rec 72:116 Jl 24

New theory of cast-iron water main breaks. II. J. Weierhauser. Eng Rec 72:36 JI 17 '15 Penstock breaks cripple Seattle power plant. il Eng Rec 71:471 Ap 10 '15 Pipe joint fails by pulling out at elbow. il Eng Rec 72:390 S 25 '15 Sixty-seven breaks in a cast-iron water main. C. E. Davis. map Eng N 74:244-5 Ag 5 '15 Surface warnings of street subsurface failures. R. Klotz. Eng N 74:331 O 28 '15 Vacuum wrecks pipe line. il Metal Work 84: 217 Ag 13 '15

### Leakage

See Water waste

### Repair

Diver repairs parted intake line at Evanston. Eng Rec 72:10 Jl 10 '15

Five 4-foot water mains underpinned after break, diag Eng Rec 72:7-8 Jl 3 '15

Laying and repairing water mains. W. W. Albin, Metal Work \$4:102 Jl 23 '15

Methods employed in repairing a submerged water main at Edmonton, Alberta, J. Hamilton, diag Eng & Contr 44:387 N 17 '15

Repairing a split water main, il Eng N 74: 847 O 28 '15

Repairing leaks in flexible jointed water main

847 O 28 '15
Repairing leaks in flexible jointed water main in 40 ft. of water, Galveston harbor, Texas. N. T. Blockburn. diags Eng & Contr 42: 163-4 Ag 12 '14
Utilizing hydraulic principles to locate a leak in a submerged pipe. E. G. Hooper. Eng & Contr 44:261-2 O 6 '15

### Testing

Pressure test shows little leakage from huge molded concrete pipe. il Eng Rec 72:537-8 O

Testing water-main flow. R. C. Hardman. Eng N 74:848 O 28 '15

Water pollution

Vater pollution

Buffalo sewage disposal and water-supply in relation to the pollution of the Great Lakes.

Eng N 73:8-9 Ja 7 '15

Contamination of a drinking and railroad water supply by sea water and the removal of the salt water from the reservoir. J: R. Downes.

Am Water Works Assn J:709-14 D '14

Contamination with the reservoir of the salt water works as the contamination of the salt water works as the contamination of the salt water works as the contamination of the salt water works.

Court forbids river pollution by filter washwater. Eng Rec 72:160-1 Ag 7 '15

Establishing and enforcing a British standard for sewage effluents. Eng N 72:1325 D 31 '14

Good water for farm homes. Sci Am S 80:57 Jl 24 '15

Leaky check valve between public and contaminated industrial water supplies at Circleville, O., causes typhoid outbreak. W. H. Dittoe and F. G. Boudreau. Eng & Contr 42:177 Ag 19 '14

Legal decision in a water supply pollution case. J. W. Ackerman. Am Water Works Assn J 1:688-93 D '14

New Jersey supreme court upholds decision awarding damages for illness contracted from drinking impure water supply. Eng & Contr 43:423-4 My 12 '15

Pollution of California water supply wells by discharges from sewage wells. C: G. Hyde. Eng & Contr 44:340 O 27 '15

Pollution of public water supplies through connections to industrial supplies. L. H. Van Buskirk. Eng & Contr 43:219-22 Mr 10

Pollution of rivers, il Munic J 39:75-6 Jl 15

Surface drainage a controlling factor in stream pollution. G: H. Norton. Eng & Contr 44: 327-8 O 27 '15

Treatment of District of Columbia sewage. A. E. Phillips. Eng Rec 72:506 O 23 '15

Troubles from abnormally high coloring in Rhode Island water supplies. S. D. Gage. Eng & Contr 44:356-7 N 3 '15

U. S. public health service. H. P. Letton. Munic J 38:220 F 18 '15

Water analysis and the nitrogen content of water. W: M. Booth. Am Water Works Assn J 2:61-4 Mr '15

Water-borne typhoid fever epidemic at Healds-

Water-borne typhoid fever epidemic at Healds-burg, Cal. W. A. Sawyer. Eng & Contr 44: 179-80 S 8 '15

173-80 S S 15 Water pollution enjoined at Niagara Falls. Eng N 74:232 Jl 29 '15 Water-typhoid suit lost. Eng N 74:631-2 S 30

Sewage; Water purification; See also S Water supply

Water power

Vater power

Business engineering problem in water power
development with the solution for a specific
case. W. V. N. Powelson. Eng & Contr 43:
222-6 Mr 10 '15
Comparative water power resources and utilization of European countries, Canada and
the United States. Eng & Contr 43:156 F 17

Conditions that will encourage hydroelectric development. J: A. Britton. Elec W 64:1236-8 D 26 '14

D 26 14
Damages for loss of water power; abstracts.
F. W. Dean. Am Soc M E J 37:174-6 Mr
'15; Power 40:902 D 22 '14
See also Dams; Flumes; Hydraulic engineering; Hydraulic machinery; Hydroelectics

tric plants

## Alabama

Future of water-power development in Alabama, T: W. Martin, Elec R & W Elec'n 67:850-1 N 6 '15

# California

California agreement on water power develop-ment of national forests. Power 40:867-8 D 15 '14

## Canada

Canadian hydraulic power. C: H. Mitchell. Power 42:596-7 O 26 '15

# Idaho

Water power and its relation to irrigation in southern Idaho. J: C. Beebe. il Assn Eng Soc J 54:63-78 F '15

## Illinois

Report on water-power development on the Chicago drainage canal. Eng N 72:1139 D 3

## New England

Water powers of New England. H: I. Harrl-man, il Gen Elec R 18:358-65 My '15; Ab-stract. Elec W 65:751-2 Mr 20 '15

## Norway

Norwegian waterfall concessions. Power 41: 781 Je 8 '15 Water powers in Norway; abstract. Elec W 66:986 O 30 '15

## Russia

Russia's power resources; extensive water falls and peat deposits await exploitation. maps Eng M 49:909-12 S '15

## Switzerland

Water-powers of Switzerland. Elec W 66:250 Jl 31 '15

## United States

Bill to open the way for water-power develop-ment. Eng N 73:131-2 Ja 21 '15 Census of primary power equipment. Eng Rec 71:136 Ja 30 '15

Water power-United States-Continued

Development of water power on public lands, Eng Rec 71:75-6 Ja 16 '15 Failure of water-power legislation. H. L. Copper, Elec W 65:700 Mr 13 '15

Federal and state control of water-power; California and Oregon. L. Lundgren. il Elec W 66:336-8 Ag 14 '15; Same cond. Power 42: 157-8 Ag 3 '15; Same cond. Eng N 74:600-1 S 23 '15

S 23 15 Ferris bill at water power conference assailed. Eng Rec 72:429+ O 2 '15 Intermittent waterfall; using the power of Niagara falls without impairing its scenic beauty. E. Dunn. il Sci Am 113:492-3+ D 4

Irretrievable waste of conservation. Elec W 66:511-12 S 4 '15

66:511-12 S 4 '15

Merging hydro-electric interests. Power 41:
681-2 My 18 '15

National conservation and water powers, H. H.
Chapman, il Am For 21:981-6 O '15
No teneral curb on western tower development, O. C. Merrill, Eng N 74:873-5 N 4 '15
Obstructive legislation: attempting to defeat the Ferris water-power bill. Power 41:129-30
Ja 26 '15
Senate committee told water power 1.

Ja 26 '15

Senate committee told water-power bill would retard development. Elec W 65:54-7 Ja 2 '15

Testimony of Mr. Sidney Z. Mitchell on the water-power bill. Elec W 65:187-9 Ja 16 '15

Testimony on water-power bill. G. Pinchot; P. M. Lincoln. Elec W 65:131 Ja 9 '15

Water-power bills before Congress. Power 41: 72-3 Ja 12 '15

Water-power legislation: Adamson and Ferris bills. Power 41:57-8 Ja 12 '15

Water-power utilization in the West considered by governors. Elec R & W Elec'n 67:482-3 S 11 '15

Western conference on state control of water-

Western conference on state control of water-power. Elec W 66:682, 734-6 S 25-O 2 '15 Western water-power conference favors state rights. Power 42:531 O 12 '15 West's water powers. Eng Rec 72:405 O 2 '15

Water power electric plants. See Hydroelectric plants

Water pressure

derman studies of uplift pressure on masonry dams. R. Schaefer, diags Eng & Contr 44: 218-21 S 22 '15

Percolation and upward pressure of water; abstract. W. A. Mitchell. Am Soc M E J 37:121-2 F '15

Water purification

Air-bound filters. R. S. Weston; J. W. Ellms. Eng Rec 72:458 O 9 '15 Air-bound filters the chief difficulty in operat-ing Wilmington's water purification plant, E. M. Hoopes, jr. il plans Eng Rec 72:282-4

E. M. Hoopes, jr. il plans Eng Rec 72:282-4 S 4 '15

Akron's water purification plant. diags Munic J 38:725-8 My 27 '15

Akron's water purification plant. diags Munic J 38:725-8 My 27 '15

Automatic liquid-chlorine water disinfecting plant at Stamford, Conn. J. A. Newlands. il Eng N 73:1158-9 Je 17 '15

Bubbly creek filter plant adopts liquid chlorine treatment. C. A. Jennings. Am Water Works Assn J 2:401-3 Je '15; Same. Eng N 73:555 Mr 18 '15; Same. Eng Rec 71:338 Mr 13 '15

Camp engineering—water purification. Sci Am S 79:383 Je 12 '15

Cincinnati plant has eliminated water-borne typhoid. Eng Rec 72:336 S 11 '15

Circulating water screens. H. Addison. diag Engineer 120:202 Ag 27 '15

Collapsible hypo plant packed in a trunk. il diag Eng Rec 71:373 Mr 20 '15

Columbus waterworks makes its own alum—a revolutionary step in water purification practice. C: P. Hoover. il plan Eng Rec 71: 576-7 My 8 '15; Same. Eng & Contr 43:448-9 My 19 '15

Contributions of the chemist to the potable vector industry. W. P. Mescen J. Linde Spice.

My 19 '15 Contributions of the chemist to the potable water industry, W: P. Mason. J Ind & Eng Chem 7:289-90 Ap '15 Cost and efficiency data on water purification at Erie, Pa., during early months of opera-tion. Eng & Contr 44:160-1 S 1 '15

Design features of the Montebello water filters, Paltimore, Md. il Eng & Contr 44:198-9 S 15

Development of ultra-violet water disinfection. il diag Eng N 74:634-6 S 30 '15

Disinfecting large public water supplies. T. Horton. Metal Work 84:40-1 Jl 9 '15 Disinfecting Sacramento's water supply—temporary plant for introducing chlorine gas. il Munic J 38:564 Ap 22 '15 Dry-feed apparatus solves Ithaca's coagulant problem. H: N. Ogden. il plan Eng Rec 71: 586-7 My 8 '15 Dry feed of chemicals in water purification. W. F. Monfort. Am Water Works Assn J 2:200-5 Mr '15; Discussion. 2:315-16 Je '15 Effect of filtration and sterilization on typhoid fever in Philadelphia. F. D. West. Munic J 39:111-12 Jl 22 '15 Efficiency of the liquid chlorine sterilization plant at Wakefield, Mass.; abstracts. E: C. Sherman. il Eng & Contr 44:410 N 24 '15; Munic J 39:811 N 25 '15 Excess lime method of water purification. Engineer 120:128 Ag 6 '15 Household water sterilization with hypochlorite of lime. Eng & Contr 43:572 Je 30 '15 Hypochlorite treatment at Ludington. G: W. Clark. plan Munic J 38:394 Mr 25 '15 Kinks in the control of hypochlorite at Denver. W. W. De Berard. il Am Water Works Assn J 2:442-5 Je '15; Same. Eng Rec 71:393-4 Mr 27 '15 Liquid chlorine sterilization of the water sup-

Liquid chlorine sterilization of the water supply of St. Catharines, Ontario. A. Milne, il plan Eng & Contr 43:188-90 Mr 3 '15
Marysville, Kan., filters handle excessively turbid water. C. C. Young. Eng Rec 72:290-1 S

Mew water filtration plant at Quincy, III. W. R. Gelston. il diag Am Water Works Assn J 2:446-52 Je '15; Same. Munic Eng 48: 297-8 My '15; Discussion. Am Water Works Assn J 2:452-4 Je '15

Assn J 2:452-4 fe 16
Novel, simple method of applying liquid chlorine under pressure. J. W. Ledoux. Eng & Contr 43:519 Je 9 '15
Observations of some European water purification and sewage disposal plants. E: Bartow. il Am Water Works Assn J 2:13-24 Mr

Operations of the Cincinnati water-filtration plant for 1914. J. W. Ellms. il Eng N 73: 854-6 My 6 '15

Ozone treatment for drinking water. il Engl-neer 120:371 O 15 '15 Prevention of weed growth in water supply reservoir by coppering. Eng & Contr 43:572

Je 30 15
Production and application of ultra-violet rays, particularly for water purification.
M. von Recklinghausen. il diags Assn Eng Soc J 54:101-9 Mr '15
Purification of water by the ultra-violet rays.
M. von Recklinghausen. il diags Am Water Works Assn J 1:565-84 S '14; Same. Sci Am S 79:10-12 Ja 2 '15; Discussion. Am Water Works Assn J 1:585-8 S '14

Purifying drinking water on the field. Sci Am S 80:288 O 30 '15

Relative efficiency of liquid chlorine and hypo-chlorite of lime. F. E. Hale. Eng & Contr 43:173-4 F 24 '15

Rotary screens remove macro-organisms from Denver's lake water supply, il Eng Rec 72: 291-2 S 4 '15

Senfrot chemical injector, diag J Ind & Eng Chem 7:354 Ap '15 Seven years' successful operation of double sand filtration plant at South Norwalk, Conn., in removal of objectional tastes and odors, H. W. Clark. Eng & Contr 44:262-3 O

Small waterworks revamped under service; rapid sand filters and new pumping station constructed at Painesville, Ohio. G. W. Knight and R. F. MacDowell. plan Eng Rec 72:287-8 S 4 '15

Sterilization of water by ultra-violet rays of the mercury-vapor quartz lamp. M. von Recklinghausen. diags Am Inst E E Pro 33: 1049-62 Je '14; Same cond. Eng M 47:756-8 Ag '14; Abstract and discussion. Elec R & W Elec'n 65:33-4 Jl 4 '14; Discussion. Am Inst E E Pro 33:1906-12 D '14

Sterilization of water-supplies for troops on active service. G. S. Woodhead. Sci Am S 79:292-3 My 8 '15

Water purification -Continued.

Vater purification—Continued.

Sterilizing water with ultra-violet light; abstract. diag Elec W 66:820 O 9 '15

Ultra-violet rays and their application for the sterilization of water. M. von Recklinghausen. il diags J Fr Inst 178:681-704 D '14

Uniformity in compiling and reporting statistics of water purification plants. Eng & Contr 42:332-3 O 7 '14

Use of copper sulfate in the purification of swimming pools. S. J. Thomas. J Ind & Eng Chem 7:496-9 Je '15

Use of liquid chlorine at Buffalo water-works intake. H. F. Wagner. il plan Eng N 73:856-7 My 6 '15

Variations in practice disclosed by water ster-

variations in practice disclosed by water sterilization statistics; status of hypochlorite and liquid chlorine methods of treatment. F. F. Longley. Eng Rec 71:291-2 Mr 6 '15; Summary. Eng N 73:453 Mr 4 '15; Water borne typhoid in Sacramento, Calmiteresting application of liquid chlorine. N. E. Williamson. Eng & Contr 44:314 O 20 '15

Water coagulation, sedimentation and aeration plant at Norristown, Penn. S. C. Corson. il diags Eng N 73:853 My 6 '15 Water-disinfecting outfit for field use. il Eng & Min J 99:533 Mr 20 '15 Water purification in Columbus, Ohio. C: P. Hoover. Munic Eng 49:101-2 S '15 Columbus, Ohio. C: P. Hoover. Munic Eng 49:101-2 S '15 Water-purification results at Cincinnati in 1914. J. W. Ellms. Eng N 73:964 My 20 '15 Water sedimentation, coagulation and mechanical filtration at Waco, Texas. il Eng N 72: 1162-3 D 10 '14 Water-supply and typhoid fever at Cumberland, Md. A. G. Fowler and M. J. Colton. il Eng N 73:969-70 My 20 '15 Water supply treatment at Council Grove, Kansas. L: L. Tribus. il diags Am Water Works Assn J 2:83-102 Mr '15 Whipping chemicals into a colloidal water increases efficiency. il plans Eng Rec 72:292-3 S 4 '15 sedimentation and

Sec also Feed water purification; Filters and filtration; Oil separators; Water—Bacteriology; Water aeration; Water softening; Water supply

Water rates
Ashland, Wis., water-rate decisions explained.
W. E. Miller. Eng Rec 71:805-7 Je 26 '15
Birmingham, Ala., water-rate agreement. Eng
N 73:552-3 Mr 18 '15
Charges for London water. Engineer 119:298
Mr 26 '15
Charges for revises water rates in Leaven-

Mr 26 '15
Commission revises water rates in Leavenworth, Kan. Eng N 74:217 Jl 29 '15
Example of direct competition between publicly and privately owned water works plants in Tarentum, Pa. L. Hudson. Eng & Contr 44:162-3 S 1 '15
Experiences of a city of 6,000 population with water waste, famines, meters and rates. C. J. Renner. Eng & Contr 43:54-6 Ja 20 '15
Making of water meter rate schedules. Eng & Contr 43:191-3 Mr 3 '15
Regulation of water rates, Pocatello, Idaho. Munic Eng 47:457-8 D '14
Water-works charges and depreciation at Fargo. Eng N 73:994-5 My 20 '15
Vater rights

Water rights

Appraisal of water right values. H. P. Gillette. Eng & Contr 44:157-8 S 1 '15 California agreement on water power development of national forests. Power 40:867-8 D

Water-power bills before Congress. Power 41: 72-3 Ja 12 '15 Water-power legislation: Adamson and Ferris bills. Power 41:57-8 Ja 12 '15 What an engineer should know about water rights. M. Bien, Eng & Contr 43:412-14 My

See also Water supply

Water softening

Bartlett-Graver water softener, il Colliery 35: 842 Ja '15

842 Ja '15 Method of softening and purifying feed water used by a Brooklyn company. diags Elec W 66:413-14 Ag 21 '15 Six years of softened and purified water at McKeesport, Pa. E: C. Trax. Eng & Contr 44:137-8 Ag 25 '15

Softening plant converts hard, impure river water into boiler feed supply. il Eng Rec 72:622-4 N 20 '15 Value of permutized water for processing yarns. A. R. Calvo. Textile World 49:243-4-

Water softener effects economy in central-station plant. Elec R & W Elec'n 67:207-8 Jl

Vater softener in feed-water treats H. R. Dorman, il Power 42:246-8 Ag 17 See also Water purification

Water stills. See Distillation

Water storage

Decoloration of stored water is due to bleaching by sunlight and oxidation. R. H. Stearns. Eng Rec 72:318-19 S 11 '15

Water supply
Biochemical and engineering aspects of sani-tary water supply. G: W. Fuller. J Fr Inst 180:17-61 J1 '15

Cooled drinking water. R. F. Massa. Am Water Works Assn J 2:422-33 Je '15; Abstract. Eng M 49:916-17 S '15
Ground water supplies. W: S. Johnson, il diags Boston Soc C E J 2:169-89 My '15; Same cond. Eng & Contr 44:29-31 J1 14 '15 Johnson, il My '15;

Growing value of ground water supplies. L. J. Le Conte. Am Water Works Assn J 1:715-16 D '14

Problems in power-plant design. (Engineers' study course) C: L. Hubbard. Power 40:931-2; 41:32-4 D 29 '14-Ja 5 '15

Stripping water-works reservoirs. Stearns. Eng N 74:302-5 Ag 12 '15

Study of a water supply by pumping for concrete road construction, plan Eng & Contr 43:467-8 My 26 '15

Unique water-supply of Newark, N. J. il Eng N 73:863-5 My 6 '15

See also Aqueducts; Artesian wells; Cats-kill aqueduct; Cisterns; Dams; Drinking fountains; Electric plants—Water supply; Feed water; Filters and filtration; Fire ser-vice; Hot water supply; Hydrants; Irriga-tion; Plumbing; Pumping stations; Pumps; Railroads—Water supply; Reservoirs; Snow surveys; Standpipes; Surge tanks; Water; Water companies; Water meters; Water pol-lution; Water purification; Water rights; Water supply engineering; Water tanks; Water towers; Waterworks; Wells; also names of cities, subhead Water supply See also Aqueducts; Artesian wells; Catsnames of cities, subhead Water supply

### Cost

Question box: What it costs per consumer to read meter, make out bill, deliver bill and col-lect bill? Am Water Works Assn J 1:675-6 D '14

See also Water pipes-Cost

## Rates

See Water rates

## Argentina

Water supply and drainage in Argentina. A. Dale. il Metal Work 84:103-6 Jl 23 '15

Sanitary features of the Los Angeles aqueduct. E. O. Slater, map J Ind & Eng Chem 7:622-5 Jl '15

### Hawaiian Islands

Potable water supplies of the Hawaiian islands. S. W. Tay. Munic J 38:104 Ja 28 '15

## Illinois

Improved water from deep wells in northern Illinois. C. B. Williams. Am Water Works Assn J 2:410-15 Je '15; Same. Munic Eng 48: 306-7 My '15

### lowa

Representative Iowa water supplies. J Dunlap. Eng & Contr 43:76-7 Ja 27 '15 J: H.

State supervision of public water-supplies in Kansas, F. R. Hesser, Eng N 74:546-7 S 16

### Water supply -- Continued.

#### Massachusetts

Water-supplies and health in Massachusetts. A. L. Gammage. Eng N 74:1077-9 D 2 '15

Chemical standards for the hygienic purity of public water supplies in Montana, W. M. Cobleigh, Eng & Contr 42:178 Ag 19 '14

#### New York

Yonkers water supply and its future development. D. F. Fulton, map Am Water Works Assn J 2:1-8 Mr '15; Discussion. 2:8-12, 311-13 Mr, Je '15

#### Panama

Contamination of a drinking and railroad water supply by sea water and the removal of the salt water from the reservoir. J: R. Fownes. Am Water Works Assn J 1:709-14 D '14

#### Texas

Meeting water-supply shortage at Henrietta, Tex. T: L. Fountain. Eng N 73:1129 Je 10 Tex.

Vater supply of Longview, Texas. P. E. Green. Am Water Works Assn J 2:416-21 Je

## Washington, D. C.

Relations between the water supply and typhoid fever in Washington, D. C. J. Gaub. Am Water Works Assn J 1:727-33 D'14

Water supply, Rural
Unsatisfactory water supply system in a
country house. plan Dom Eng 72:320-1 S 11

Water supply and sewage disposal. Metal Work 84:398 S 24 '15
Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger. diags Dom Eng 72:194-7, 224-6, 254-6, 284-6, 313 Ag 14-S 11 '15

Ag 14-S 11 '15

Water supply engineering
Addition to Hartford waterworks system augments daily supply by 30,000,000 gallons. il map Eng Rec 72:289-90 S 4 '15
Blast-furnace plant auxiliaries and general arrangement. J. E. Johnson, jr. diag Met & Chem Eng 13:373-7 Je '15
Chicago water works notes. il Munic J 37:918-19 D 24 '14
Chicago's new tunnel and pumping station part of comprehensive waterworks plan. H. S. Baker. map Eng Rec 71:73-4, 103-4 Ja 16-23 '15
Cleveland west side water-supply tunnel. il

16-23 '15
Cleveland west side water-supply tunnel. il diags plan Eng N 73:4-8 Ja 7 '15
Conditions encountered and methods employed in laying water pipes in the congested streets of New York city. M. Blatt. Eng & Contr 44:246-7 S 29 '15
Constructing shaft and tunnel at Lake View pumping station, Chicago water works. H: W. Clausen. Eng & Contr 42:500-1 N 25 '14

Construction of Cumberland waterworks. F. H. Eastman. il Eng Rec 71:137-8 Ja 30 '15 Construction of water works tunnels in the Metropolitan water district of Massachusetts, W: E. Foss. il diags map Eng & Contr 42: 84-9, 129-31, 352-5, 451-3 Jl 22, Ag 5, O 14, N 11 '14

Construction plant and methods employed on new water works intake tunnel at Milwaukee. il diags plan Eng & Contr 43:352-5, 371-2 Ap 21-28 '15

Costs and special features of the new water supply of Victoria, British Columbia. B. Ehle. il diags Eng Rec 72:406-10 0 2 '15

Curves on Winnipeg aqueduct built with straight sections of forms. diags Eng Rec 72:657-8 N 27 '15

Design and methods and cost of constructing the Los Angeles city trunk line, connecting aqueduct to distribution system. B. A. Heinly. il diags Eng & Contr 43:390-4 My 5

Designing small water works systems. Eng & Contr 42:207-8 Ag 26 '14
Fall River's proposed water supply system, il diag Sci Am 113:353+ O 23 '15

Five 4-foot water mains underpinned after break, diag Eng Rec 72:7-8 Jl 3 '15
Hetch Hetchy water supply project. Eng & Contr 43:sup22-3 Mr 3l '15
Installing water service connections at New Orleans, Eng & Contr 42:164-5 Ag 12 '14
Interesting chart of Pittsburgh water system, showing its recent transformation, diag Eng N 73:250-1 F 1l '15
Leakage from Cedar lake reservoir, Seattle water-supply, C: E. Fowler, il map plan Eng N 73:112-15 Ja 2l '15
Lynn waterworks improvement. W. B. Conant, il Munic J 39:651-2 O 28 '15
Method and cost of constructing and repairing submerged water pipe lines at Portland, Ore, D. D. Clarke, diags Eng & Contr 42: 538-42 D 9 '14
New England water-works association 34th annual convention. Eng N 74:566-8 S 16 '15
New England water works association 34th annual convention. Munic J 39:443-6 S 16 '15
New intake tower and tunnel at the St Louis

New intake tower and tunnel at the St. Louis

New Intake tower and tunnel at the St. Louis water works. E: C. Davis. il diags plans Assn Eng Soc J 53:281-300 D '14
Pipe distribution systems; with discussion. N: S. Hill, ir. maps Am Water Works Assn J 2:107-59 Mr '15
Placing the Milwaukee waterworks intake crib. R. E. Stoelting. il diag Eng N 73:1058-9
Je 3 '15

Plan for condensing-water supply for Fall River, Mass. H. S. Knowlton. plan Power 42:643-4 N 9 '15
Progress in water supply. A. Hazen. Eng Rec 71:5-6 Ja 2 '15
Rebuilding the Omaha water-intake cribs. G: T. Prince. il diags Eng N 74:342-4 Ag 19

Relocation and mapping of uncharted portions of water distribution systems. C. E. Davis. Eng & Contr 43:74-5 Ja 27 '15; Same. Munic Eng 48:137-9 F '15; Abstract. Eng N 73: 250 F 11 '15

Jan Francisco's future water-supply: Hetch Hetchy project. A. J. Cleary. il Eng N 73: 298-301 F 18 '15

298-301 F 18 '15
Seventy years of civil engineering. il Sci Am
112:527 Je 5 '15
Sooke lake water-supply for Victoria, B. C.
C. H. Rust. Eng N 74:996-7 N 18 '15
Ten and three-quarters miles of 36-inch
riveted-steel pressure line built on Sooke
work. B. Ehle. il plan Eng Rec 72:564-5 N

6 '15
Underflow water-supply at Moline, Kan.
W. L. Benham. Eng N 73:925-6 My 13 '15
Unusual water-supply for power plant. F: B.
Hays. plan Power 42:684 N 16 '15
Virgin country renders concrete pipe line construction difficult. B. Ehle. il diags plan Eng
Rec 72:507-10 O 23 '15
Water-pipe tunnel, Metropolitan water-works.
B. Lawrence. il diags Eng N 73:1116-21 Je
10 '15
Water works.

Water works engineering mistakes. D. H. Maury, Eng & Contr 42:246-7 S 9 '14
Western Australian goldfields: how water supplies are provided. L. E. Shapcott, il Sci Am 111:508-9 D 19 '14

Wilson avenue water tunnel at Chicago. diags plan Eng N 73:764-7 Ap 22 '15

See also Aqueducts; Canals; Dams; Filters and filtration; Hydraulic engineering; Irrigation; Pipe laying; Plumbing; Pumping stations; Pumps; Railroads—Water supply; Siphons; Water conduits; Water flow; Water hammer; Water meters: Water pipes; Water towers; Waterworks; also Catskill aqueduct; Los Angeles aqueduct

### Examinations

Civil-service examination for water-works engineer. Eng N 74:1071 D 2 '15

Water supply for factories Cooled drinking water, R. F. Massa. Am Water Works Assn J 2:422-33 Je '15; Ab-stract. Eng M 49:916-17 S '15

Providing a shop drinking water system. S. H. Bunnell. Metal Work 83:695-6 My 14

Test of a mill drinking water system. F. E. Brown. Iron Age 96:110-11 Jl 8 '15

Water supply for factories—Continued Two-pressure hydraulic service. A. D liams. plan Power 41:671-2 My 18 '15 Two-pressure hydraulic service. W: diag Power 42:23 J1 6 '15 D. Wil-

Hirst.

Vater tanks
Controlling the water-supply to a closed tank.
B. C. Luce. plan Eng N 74:271 Ag 5 '15
Municipal water tank bursts under air pressure. W. Chipman. il Eng N 74:880 O 28 '15
Reinforced-concrete tank of 100,000-gallon capacity designed by use of diagrams. A. R. James. diags Eng Rec 72:135-6 Jl 31 '15
Steam coil in water tank. J. E. Noble. diag
Power 41:756 Je 1 '15
Water-tank controlling device. plans Power

Water-tank controlling device, plans Power 41:680 My 18 '15; Same, Eng & Min J 99: 905 My 22 '15; Same, Eng & Contr 44:360 N

See also Water towers

Water towers

Appearance considered in German water towers, diags Eng Rec 72:48-9 Jl 10 '15 Artistic American water tower, C. S. Pillsbury, il Eng Rec 72:174 Ag 7 '15 Design and construction of the new 500,000-gal, elevated water tank at Appleton, Wis. D. D. Williams, il Eng & Contr 44:130-1 Ag 18 '15 Rajlway readeds.

18 '15
Railway roadside water tanks for locomotive supply; with comparative costs of wood and steel structures. diag Ry Age 59:955-8 N 19 '15; Abstract. Ry R 57:517-18 O 23 '15 Stability of unanchored tanks. C. R. Knowles. Ry Age 59:954 N 19 '15
Wood vs steel water tanks. J. Dupree. Ry R 56:536 Ap 17 '15
Wooden versus steel water tanks. M. D. Miller. Ry R 57:23-5 J1 3 '15

See also Standpipes; Surge tanks; Water tanks

Water towers, Concrete

Building concrete silos; with water towers. C. D. Gilbert. il diags Concrete Cem 7:61-2

Ag '15
Concrete surge tank, disconnected at base, operates on differential principle, il diag Eng Rec 71:368-70 Mr 20 '15
Duxbury reinforced-concrete water-works tank, il diag Eng N 73:382-3 My 6 '15
Earthquake-proof concrete tower, San Francisco, Eng N 74:308-9 Ag 12 '15
Methods and costs in constructing a combined concrete silo and water tank, il diag Concrete Com 6:162-4 Mr '15
Reinforced concrete for railway water tanks. J T. Bowser, Eng Rec 71:81-2 Ja 16 '15
Reinforced-concrete tower tank at Middle-borough, Mass. G; A. Sampson, diags Eng N 74:392-4 Ag 26 '15
Vater-tube boilers, See Boilers, Water-tube

Water-tube boilers. See Boilers, Water-tube

Water waste
Allowable leakage from cast iron water
mains; abstracts. E. C. Bradbury. Eng &
Contr 42:49-550 N 25 '14; Eng Rec 70:330-1
S 19 '14; Eng N 72:725 O 8 '14; Munic J 38:
251-2 F 25 '15
Cost of wasting water. Munic J 39:363-4 S 2 '15
Data and discussion on leakage from cast
iron water mains. J. W. Ivy. Eng & Contr
43:568-9 Je 30 '15

Data on consumption and cost of water for uses difficult to control if the supply is unmetered. W: F. Sullivan. Eng & Contr 42:310-11 S 30 '14

Demonstrating the cost of water waste, il Eng N 74:319-20 Ag 12 '15

Detecting underground leaks—methods employed by numerous cities. Munic J 38:542-3 Ap 22 '15

Detecting water waste at St. John's, foundland. Munic J 38:103-4 Ja 28 '15

Economies of water waste in cities. R. O. Wynne-Roberts. Eng & Contr 42:330-2 O 7

Experiences of a city of 6,000 population with water waste, famines, meters and rates. C. J. Renner. Eng & Contr 43:54-6 Ja 20 '15

Increasing precision in pitometer survey work at Washington, D. C.—meter reading. Eng & Contr 43:26 Ja 13 '15

Leakage from lead joints; abstracts. A. H. Smith, Munic J 39:470-1 S 23 '15; Eng & Contr 44:313-14 O 20 '15
Public education on water waste. Munic J 39: 502-3 S 30 '15

502-3 S 30 '15
Results of meterage at Columbus, Ohio, with special reference to restriction of waste in lawn sprinkling. J. O'Shaughnessy. Eng & Contr 43:190-1 Mr 3 '15
St. Louis gives object lessons of water waste. Eng Rec 72:330 S 11 '15
Saving in the pump room. W: E. Dixon. diag Power 41:171-2 F 2 '15
Wash water salvage at Champaign and Urbana. H. E. Babbitt. Am Water Works Assn J 2:393-6 Je '15
Waste prevention by individual meters versus

J 2:393-6 Je '15 Waste prevention by individual meters versus district meters. R. O. Wynne-Roberts. Am Water Works Assn J 2:397-400 Je '15; Same. Eng & Contr 44:32-3 Jl 14 '15 Water waste. C. R. Knowles. il Ry Age 59: 756-8 O 22 '15

Water works statistics for the year 1914; waste prevention. Munic J 33:551-3 Ap 22

See also Seepage; Water meters

Water wheels

Analysis of waterwheel-governor effort; abstract. E. D. Searing. Elec W 65:1513-14 Je

Bamboo waterwheel used for Philippine irrigation. J. W. Swaren. il Eng Rec 71:814 Je 26 '15
Change of runners permits 100 per cent head increase. W. V. N. Powelson. Eng Rec 71: 202 F 13 '15

Hydraulic turbines; wheels and pumps at the Panama-Pacific exposition. H. J. Kennedy, il Sci Am S 80:124-6 Ag 21 '15 Impulse wheels for 5000-ft, head, Lac Fully plant; abstract. F. Prasfi, diags Eng N 73: 138-9 Ja 21 '15 Old waterwheel at Troy ran continuously 45 years. E. A. Vivarttas. il Eng Rec 71:752 Je 12 '15

Practice in high-head hydraulic plants; abstract. J. P. Jollyman. Elec W 65:1513 Je 12

Repair to waterwheel. J. W. Swaren. il Power 41:838 Je 22 '15 Water motors operate gate-valves in nozzle lines. J. W. Swaren. il Eng Rec 72:134 Jl 31

Waterwheel designed for mule-back transportation, il Eng Rec 71:198 F 13 '15

See also Turbines

Water works. See Waterworks Waterfowl, See Water birds

Watering-stations

Street watering-station. F. E. Merrill, dias Eng M 49:274-5 My '15

Waterproofing
History of Attleboro, Mass., standpipe of reinforced concrete. il Eng N 73:816-18 Ap 2 '15

Making concrete tight; Tacoma and Seattle water-works. C. E. Fowler. il Eng N 74 1076-7 D 2 '15

Method and cost of waterproofing settling basin bottoms at St. Louis. G. G. Black. Eng. & Contr 44:103 Ag 11 '15

Methods and costs of waterproofing concret surfaces to decrease disintegration by fros J. L. Lytel. Eng & Contr 43:346-7 Ap 14 '1

Methods used to waterproof bridge floors. En & Contr 43:399-400 My 5 '15

Oil-mixed Portland cement concrete. L. V Page. U S Agric Bul 230:1-26 '15; Abstrac Eng & Contr 44:227-9 S 22 '15; Excerpt. En Rec 72:334-5 S 11 '15; Excerpt (Oil-mixe concrete for damp proofing) Munic Eng 4. 375-6 Je '15; Same. Bldg Age 37:24 Ji '1 Same. Am Gas Light J 103:29 Ji 12 '15; Sam Concrete Cem 7:30 Ji '15

Relining a small bricklined water work reservoir with asphalt and concrete : Irwin, Pa. J: M. Rice. il diags Eng & Con 43:273-4 Mr 24 '15

Waterproofing--Continued

Aterproofing—Continucal
Repairing and waterproofing the Nashville
water-works reservoir. W. W. Southgate. il
diags Eng N 73:849-52 My 6 '15
Test results with concrete waterproofing materials. Eng N 73:125 Ja 21 '15
Tunnel waterproofing with cement-and-clay
mortar. Eng N 73:731-2 Ap 15 '15
Waterproofing concrete. L. G. Hall. Sci Am
112:629 Je 26 '15
Waterproofing concrete. S. Stope, in Sci Am

Waterproofing concrete. S. Stone, jr. Sci Am 113:291 O 2 '15

Waterproofing concrete construction. Ry R 57:91 Jl 17 '15

57:39 Jl 17 '15
Waterproofing concrete surfaces. Assn Eng
Soc J 54:275-6 Je '15
Waterproofing concrete surfaces. J. L. Lytel.
Munic Eng 49:106 S '15
Waterproofing existing concrete structures.
Eng N 73:707 Ap 15 '15
Waterproofing for concrete. Concrete Cem 7:
57 Ao '15.

57 Ag '15
Waterproofing solid steel-floor bridges, S: T.
Wagner; abstracts, diags Ry R 56:273-7 F 27
'15; Eng & Contr 43:79-81 Ja 27 '15; Revised
specifications. Eng & Contr 44:209-11 S 15
'15; Discussion, A. W. Carpenter, Ry R 56:
557-8 Ap 24 '15
Weathering of concrete prevented by waterproofing. Eng Rec 71:486 Ap 17 '15

See also Corrosion and anti-corrosives

Waterproofing of textiles Waterproofing gauze. Textile World 49:532-3 Ag '15

Waterproofing yarns and fabrics, Textile World 49:368-70 Je '15

Watersheds

Methods employed in the reforestation of the Croton watersheds. T. C. Culyer. Eng & Contr 14:202 S 15 15

Watertown arsenal

Atertown arsenal
Abolition of scientific management in government shops. L. W. Moffett. il Iron Tr R 56: 963-6+ My 13 '15
Criminal speeding-up system—and some facts. W: Crozier. Am Ind 15:30-1 Ja '15
Employees' grievance committee. Iron Age 95: 653 Mr 18 '15
Labor union, scientific management and the government. Ind Eng 15:6 Ja '15

Waterways

Vaterways
Development of inland water transportation.
J: H. Bernhard. Eng Rec 72:332-4 S 11 '15
Illinois waterway—proposed eight foot channel from Lockport to Utica. map Eng & Contr 43:201 Mr 3 '15
Inland water transportation. T. G. Dabney;
F. Lavis. Eng Rec 72:519-20 O 23 '15
Rivers and railroads in the United States,
W: W. Harts. Ry Age 58:230-1 F 5 '15; Discussion. F. Lavis. Ry R 56:660-2 My 15 '15;
Same cond. Ry Age 58:975-6 My 7 '15

See also Canals; Rivers

Waterwheels. See Water wheels

Waterworks

African water system. Metal Work 84:646 N 19'15

19 '15
American waterworks association 35th annual convention. Munic J 38:705-8 My 20 '15
Bradford waterworks. il plan maps Engineer
119:251-4, 278-80 Mr 12-19 '15
Chicago's new tunnel and pumping station part

of comprehensive waterworks plan. H. S. Baker. map Eng Rec 71:73-4, 103-4 Ja 16-23

Choice of alloys for water work design. H. Carpenter. Am Water Works Assn J 2:351-8 Je '15; Same abr. Eng & Contr 43:333-4 Ap Je '15 14 '15

incinnati builds high-pressure fire service system. J. A. Hiller. il diags Eng Rec 71:590 My 8'15 Cincinnati

Cincinnati water works, J: W. Hill. di Water Works Assn J 2:42-60 Mr '15 diag Am

Concrete rings, superimposed, sunk to form San Antonio pump pit. W: W. Hay. il diag Eng Rec 71:741-2 Je 12 '15

Cost and other data on the reconstruction of the Hamilton, Ontario, water works. A. F. Macallum. Eng & Contr 44:312-13 O 20 '15; Same. il Munic Eng 49:164-7 N '15

Council Bluffs waterworks regeneration reverses slump in population curve, il diag Eng Rec 72:286-7 S 4 '15
Design features and cost of gravity water works at Mellen, Wis. W. G. Kirchoffer, il diags Eng & Contr 44:159-60 S 1 '15
Design features of the new water works at South Orange, N. J. il Eng & Contr 43:519-20 Je 9 '15
Design features of the proposed water supply

Design features of the proposed water supply and purification works, Corpus Christi, Texas. diags Eng & Contr 42:599-600 D 30

714
Developments in the Marshall, Texas, water works in recent years. B: F. Meyers. il Eng & Contr 43:549-50 Je 23 '15
East African water system. G: A. Chamberlain. Metal Work 84:309+ S 3 '15
Electric pumping at Fairmount, Ind.; comparison of service by reciprocating steam pumps and by electrically driven centrifugal pumps. J: A. Randolph. Munic J 39:356-8 S 2 '15

2 '15 Electrically driven water-works plant. E. M. Ivens. il plan Power 42:198-200 Ag 10 '15 Electricity for municipal pumping. il Elec R. & W Elec'n 67:653-6 O 9 '15 Electricity in waterworks plants. L. E. Darling. Elec R & W Elec'n 66:369-71 My 8 '15 Erie waterworks improvements. il Munic J 39:258-9 S 2 '15 Experiences in rebuilding and reënforcing a water works system. O. T. Smith. Am Water Works Assn J 2:404-6 Je '15 How low fixed charges favor centrifugal pumps. G. H. Gibson. il plan Eng N 74:886-8 N 4 '15 Improving Liberty, N. Y., water supply. H: W.

8 N 4 '15
Improving Liberty, N. Y., water supply. H: W. Taylor, il Munic J 38:390-1 Mr 25 '15
Municipal pumping stations of Detroit. T: Wilson, il Power 41:150-3 F 2 '15
New waterworks at Madras, plans map Engineer 119:58-9, 78-81 Ja 15-22 '15
Rapid gate-closing device mounted on motor truck, il Eng Rec 70:573-4 N 21 '14; Eng & Contr 42:454 N 11 '14
St. Louis water works improvements. Munic J 39:360-1 S 2 '15
San Francisco's auxiliary water-supply for

J 39:360-1 S 2 '15
San Francisco's auxiliary water-supply for fire protection. A. J. Cleary, il plan diags Eng N 73:290-7 F 18 '15
Second rebuilding of the water-works of Montrose, Col. P. W. Pinkerton. Eng N 73: 883-4 My 6 '15
Small waterworks revamped under service; rapid sand filters and new pumping station constructed at Painesville, Ohio. G. W. Knight and R. F. MacDowell, plan Eng Rec 72:287-8 S 4 '15
Standard gate valves of the New York city waterworks, il diags Eng N 73:1016-18 My 27 '15

Steam-turbine-driven centrifugal pumps of the Toronto water works. il Eng & Contr 43:548-9 Je 23 '15

Street stop-cock of the Boston water-works department. G: H. Finneran. diags Eng N 73: 77 Ja 14 '15

Turbine-driven water-works plant, Charlotte-town, P. E. I. C. O. Thomas. il Power 42: 504-5 O 12 '15

Water supply at Wilmington, Delaware. E. M. Hoopes, jr. and J. M. Caird. il Am Water Works Assn J 1:111-34 Mr '14; Same cond. Eng & Contr 42:210-12 Ag 26 '14

Water works improvements at Jacksonville, Fla. il Eng & Contr 44:178 S 8 '15

Water-works improvements at San Diego, Cal. diags Eng N 73:343 F 18 '15

Water works improvements in 1915; tabulation. Munic Eng 48:266-7 Ap '15

Water works of Valparaiso, Ind. E. L. Loomis, il Munic Eng 49:9-12 Jl '15

Water works plant of River Forest, Illinois, K. M. Mitchell: Munic Eng 48:101-4 F '15

Works for the improved water supply of Co lumbus, Ga. plans Eng & Contr 42:496-8 1 25 '14

See also Filters and filtration; Hydrants; Pumping stations; Pumps; Water pipes; Water purification; Water supply; Water supply engineering Waterworks Continued.

Accounting

Elements of water works accounting. diags Eng & Contr 42:600-2 D 30 '14 Field and office methods employed by Louis-

Field and office methods employed by Louisville water co. in checking construction gang payrolls. G. D. Crain, jr. Eng & Contr 43: 102-3 F 3 '15
Suggestions on accounting for municipally owned water works. C. C. Clothier. Eng & Contr 43:551 Je 23 '15
Valuation of water works properties. H. P. Gillette. Eng & Contr 43:394-5, 486-8; 44:14-18 My 5, Je 2, Jl 7 '15

Cost

Cost of installing small water works systems in Massachusetts. H. R. Crohurst. il Eng & Contr 43:461-5 My 26 '15

Cost of pumping stations, pumping machinery and distributing reservoirs in small water works of Massachusetts. W: S. Johnson. Eng & Contr 42:312-13 S 30 '14

Waterworks practices and costs. Munic J 39: 148 Jl 29 '15

#### Finance

Method of assessing cost of water main ex-tensions by the municipally owned water works of Duluth Minn. D. A. Reed. Eng & Contr 43:447-8 My 19 '15

#### Inspection

House to house inspections. A. P. Folwell, Am Water Works Assn J 1:685-7 D '14

Water waste surveys in the District of Columbia. P. Lanham. il Eng & Contr 43:275-6 lumbia. P. Mr 24 '15

### Laboratories

Laboratory control of small water supplies. E: Bartow. plans Eng & Contr 43:56-7 Ja 20 '15

### Laws and regulations

Laws and regulations

Features of the Ontario statutes and their administration affecting water supplies and sewerage systems. F. A. Dallyn. Am Water Works Assn J 2:344-50 Je '15

New water works ordinance adopted by referendum at Fargo, N. D. Eng & Contr 43: 396 My 5 '15

Power of municipalities owning waterworks to compel consumers to install and pay for water meters—court decisions, J: Simpson. Munic J 37:920-1 D 24 '14

Prescribed water works operating methods in West Virginia. J. K. Anderson. Eng & Contr 44:82-3 Ag 4 '15

Water-works charges and depreciation at

Water-works charges and depreciation at Fargo. Eng N 73:994-5 My 20 '15

### Maintenance and repair

Detecting underground leaks—methods employed by numerous cities. Munic J 38:542-3 Ap 22 '15

Maintenance of the water supply distribution system of New York city. W: W. Brush. il maps Am Water Works Assn J 2:206-37 Mr '15; Same cond. Eng & Contr 44:44-7 Jl 21 '15; Discussion. F. B. Nelson. Am Water Works Assn J 2:306-10 Je '15

' Water and sewer maintenance in New Or-leans. Munic J 39:354-6 S 2 '15

### Management

Boston municipal water plant derives income from water power. W. B. Conant. il Munic Eng 49:117 S '15

Bringing order out of chaos in the McAlester, Okla., water department. R. S. Naylor. Eng & Contr 44:18-19 Jl 7 '15

Comparative cost of collecting water bills by mail and by collectors at Seattle, Wash. Eng & Contr 44:33 Jl 14 '15

Data on consumption and cost of water for uses difficult to control if the supply is un-metered. W: Sullivan. Eng & Contr 42:310-11 S 30 '14

Elements of good record keeping by water departments. J. W. Lacy. Eng & Contr 44:178 S 8 '15

Faulty operation of the average public utility

Faulty operation of the average public utility with special reference to water works. N. T. Veatch, jr. Eng & Contr 43:171-3 F 24 '15 Improvement and standardization of procedure in water works management. G: G. Earl. Eng & Contr 43:569-70 Je 30 '15 Meter maintenance systematized by waterworks department in Milwaukee. il Eng Rec 71:587-8 My 8 '15 Motor vehicles in water-works service at Los Angeles. B. A. Heinly. Eng N 73:861-3 My 6 '15

6 '15 Organization of and procedure in the water department of Pasadena, Calif. Eng & Contr 43:372-4 Ap 28 '15 Practical value of publicity to the water works man. S. C. Hadden. Am Water Works Assn J 2:359-66; Discussion. D. R. Gwinn. 2:366-70 Je '15

Provisions governing water main extensions in 135 American cities, Am Water Works Assn J 1:250-9 Je '14; Same. Eng & Contr 42:381-3

O 21 '14
Springfield water-works. il Eng N 74:406-9,
443-5 Ag 26-8 2 '15
Standard form of correspondence used in the
department of water, San Diego, Calif. Eng &
Contr 42:520-1 D 2 '14
Use of automobiles in water works service at
Worcester, Mass. G: W. Batchelder. Eng &
Contr 42:333-4 O 7 '14
Water department methods which limit per
capita consumption to 39 gals. daily at Milton, Mass. D: A. Heffernan. Eng & Contr
42:331-12 S 30 '14
See also Water meters: Water waste

See also Water meters; Water waste

### Rates

See Water rates

## Regulation

Regulation

Illinois utilities commission and the water works companies. C. G. Bennett. Am Water Works Assn J 2:382-9 Je '15

Illinois utilities commission has waterworks rules. Eng N 74:885 N 4 '15

Making water bills a lien on real property. Eng & Contr 42:425-6 N 4 '14

Michigan supreme court decision in case of Kalamazoo vs. Standard paper co. to recover value of water taken from fire lines for industrial use. Eng & Contr 42:487-9 N 18 '14

Municipal ownership. and operation of waterworks: case for state control. M. N. Baker. Eng N 72:1115 D 3 '14

Prescribed water works operation methods in Missouri. Eng & Contr 44:293-4 O 13 '15

Regulations governing preparation of reports on water supply systems and extensions in Saskatchewan. Eng & Contr 42:131-2 Ag 5 '14

Water filtration hold-up at Ottawa, Ont. Eng N 72:1167 D 10 '14

Water-works rules issued by Montana com-mission. Eng N 74:1019 N 25 '15

### Statistics

Water works analysis contains data from 5158 towns. Eng Rec 72:13 Jl 3 '15

Water works statistics for the year 1914. Munic J 38:544-57, 730-1 Ap 22, My 27 '15

### Valuation

Acquisition of private water plants by municipalities. B. M. Wagner, bibliog Am Water Works Assn J 2:25-41 Mr '15; Discussion. 2 582-4 S '15

Economic aspects of water works valuation R. E. Heilman, Am Water Works Assn J 2: 538-43 S '15

Observations on water works valuation; with discussion, J. W. Ledoux, Eng & Contr 42: 556-8 D 16 '14

Suggestion for water-works valuation. Eng N 72:1271-2 D 24 '14

Waterworks-Valuation-Continued.

Gillette. Eng & Contract.

18, 80-1, 157-8, 258-61, 356, 424-7 My 5, Je 2.

Ji 7, Ag 5, S 1, O 6, N 3, D 1, 15

Water works association, American. See American water works association

Waterworks associations Consolidation of country's waterworks associa-tions urged. G: G. Earl. Eng Rec 71:643 My

Waterworks superintendents

Choosing a first-class water works superintendent in Massachusetts. Eng & Contr 44: 292-3 O 13 '15

Questions asked in examination of applicants for position of water works superintendent at Kalamazoo, Mich. Eng & Contr 44:158-9 S 1 '15

Watt-hour meters
Effect of temperature on the accuracy of watt-hour meters. B. E. Miller. Elec W 66:636-7
S 18 '15

hour meters. E. E. Miller. Elec W 60:000-6 S 18 '15'
Following up watt-hour meter records at El Paso. il Elec Ry J 46:12-13 Jl 3' 15'
Importance of watt-hour-meter maintenance. Elec W 65:1690 Je 26' 15'
Induction watt-hour meter, V. L. Hollister. diags Am Inst E E Pro 34:1217-35 Je '15'
New-type mercury watt-hour meter. A. A. Radtke, Elec W 65:395-6 F 13' 15'
Notes on induction meter design, W. H. Pratt. il Gen Elec R 18:277-81 Ap '15'
Small, direct-current, watt-hour meter. il Elec R & W Elec'n 66:219 Ja 30' 15'
Testing polyphase watt-hour meter. F. R. Innes, diag Elec W 65:927 Ap 10' 15'
Watt-hour meter accuracy. D. D. Ewing. Power 41:244-5 F 16' 15'
Watthour meter method of testing instrument transformers. P. G. Agnew, diags U S Bur Stand Bul 11:347-57 My 10' 15'

Wattmeters

Machine-tool performance diagnosis: lessons of the power-time characteristic and value of automatic records on analyzing productive operations. Elec W 65:417-18 F 13 '15

Wave lengths. See Spectrum analysis

Wave motion

Method for calculating that part of the recoil momentum of a gun which is due to the action of the gases after the projectile leaves the muzzle. W: S. Franklin. J Fr Inst 179: 559-77 My '15 Waves

Vaves
Design of shore-protection works. R. Bennett.
diags Eng N 74:98-101 Jl 15 '15
Fighting the sea with compressed air. R. G.
Skerrett. il Sci Am 112:97 Ja 30 '15
Ripple marks; a study of water action on the
seashore. C. Epry. il map Sci Am S 80:18891 S 18 '15

See also Electric waves; Light; Shore protection; Sound; Vibrations

Wax

Myrtle wax of commerce. il Sci Am S 80:301 N 6 '15

Weather

Weather influences on mankind. Sci Am 112: 624 Je 26 '15

See also Atmospheric pressure; Rain; Storms

Veaving

Veaving
Designs for a basket weave. il Textile World
49:537 Ag '15
Hand book of weaves. G. H. Oelsner. il Textile World 46:408-11, 503-6, 586-9; 47:87-9,
280-2, 317-19, 408-12, 504-7, 594-9; 48:122-7,
208-12, 316-21, 400-3, 496-501, 589-93; 49:87-91,
163-7, 337-42 Ja '14-Je '15
Making of Scotch tweeds. T: Welsh. Textile
World 48:501-3 F '15
Weaving tubular goods. il Textile World 49:
657-8 S '15

Woven fabric, il Textile World 50:183 N '15 Nee also Cotton weaving; Lace; Looms; Silk; Textile industry and fabrics; Woolen and worsted manufacture

'ebster, Arthur Gordon, 1862-Sketch, por Eng M 50:211 N '15

Weed cutters

Gasoline-operated railway weed mower, il Sci Am 113:384 0 30 '15 Northern Texas traction weed cutter, R. E. Griffiths, il Elec Ry J 45:1121 Je 12 '15

Butternut tree as a weed eradicator, Sci Am 112:130 F 6 '15

Weeks law. See Forestry laws and legislation

Weighing

Loss of weight of musk in a current of dry air, C: B. Bazzoni, diag J Fr Inst 180:463-9

O'15 New assay balance. il Met & Chem Eng 13: 512-13 Ag'15 Ore weighing at the Bunker Hill mill, Kellogg, Idaho. Eng & Min J 100:520 S 25'15 Scheme for weighing coal during stoker trials. diag Elec W 66:695 S 25'15 Weighing of less than carload freight. E. A. O'Donnell. Ry Age 57:1197-8 D 25'14

Weights and measures
Accuracy of grain weights, F. C. Maegly, Ry
Age 58:888-9 Ap 23 '15
Measurements for the household, il U S Bur
Stand Circ 55:1-119 '15; Abstract (Efficiency
in the household), H. T. Wade, Sci Am 113:

148-9 N 20 '15

Measurements of length and area, including thermal expansion. U S Bur Stand Circ 2:

Measuring of textile fabrics, E. H. Marble. Textile World 49:85-7 Ap '15 Recording weights—calling every weight by its right name, F. C. Maegly, Ry Age 58: 270 F 12 '15

270 F 12 '15
Rules for weight of cast-iron pipes. Power 41:
425 Mr 30 '15
Search for standard weights and measures of length. Sci Am 112:175 F 20 '15
South American trade, weights and measures. Textile World 49:56-8 Ap '15
Weight of balls or spheres. W. L. Tryon. Foundry 43:356a S '15

See also Electric measurement; Gages; Measuring instruments; Mensuration; Metric system

Laws and regulations

Legal weights per bushel for various com-modifies. U S Bur Stand Circ 55:144-6 '15 Measurements for the household. U S Bur Stand Circ 55:28-30 '15

Veirs
Flow over V-notch weirs. H. A. Cozzens, jr. Power 42:714 N 23 '15
Flow over weirs with imperfect contractions. G: J. Davis, jr. diags plan Wis U Bul Eng S 8:77-145 no 2 '14
Inverted weir. E. W. Rettger. diags Eng N 73: 72-3 Ja 14 '15
Irrigation weir, measuring rod and discharge card. K. A. Heron. il diag Eng N 74:257 Ag 5 '15

Large Sutro weir under test. B: D. Moses. Eng N 74:277 Ag 5 '15 Recorder for measuring flow over weirs. il Ry Age (Mech ed) 89:433 Ag '15; Elec W 66:605-

Tests of a proportional weir, il Eng N 74:1018-19 N 25 '15

Tests of the effect of temperature on weir coefficients. F. G. Switzer. Eng N 73:636 Ap 1

V-notch weir, J; E. Rothwell, il Eng & Min J 100:142-3 Jl 24 '15

See also Water measurement

Welding

Acetylene oil-gas welding outfit. Eng Rec 70: sup279 D 5 '14
Acetylene welding of gas pipe. G: H. Manlove. il Iron Tr R 56:272-3 F 4 '15; Abstract. Ind Eng 15:57-8 F '15

Autogenous pipe welding, il Iron Age 95:296-7 F 4 '15

Autogenous soldering or welding of aluminum, il Mach 21:369-71 Ja '15

Autogenous welding produces strains in metal. S. W. Miller. Eng N 74:805 O 21 '15

Avoiding hard cast iron in oxy-acetylene weld-ing. M. K. Dunham. Mach 21:1004 Ag '15

Welding-Continued

Blacksmith's use of borax and cyanide. Eng & Min' J 99:1076 Je 19 '15
Danger of welding processes as applied to tires and wheels. M. D. Hayes. il Elec Ry J 45:942-4 My 15 '15

<sup>4</sup> My 15 <sup>15</sup> Data on oxy-acetylene welding and cutting equipment. Eng & Contr 43:543-4 Je 16 <sup>1</sup>15 Economies of welded pipe connections. il Iron Age 95:1289 Je 10 <sup>1</sup>15 Fibre helmet for welders. il Foundry 43:380 S

Fibre helmet for welders. il Foundry 43:380 S
'15
Flashback in the welding torch. M. K. Dunham. diag Mach 22:50-1 S '15
Flashback in the welding torch. S. W. Miller.
Mach 22:233-4 N '15
Flue welding. E. J. Haskins. Ry Age (Meched) 89:471 S '15
Fluxes for oxy-acetylene welding. S. W. Miller. Mach 21:786-9 Je '15
Fluxes of oxy-acetylene welding. S. W. Miller. Mach 21:1007-8 Ag '15
Gas-weld rail bonding. J. R. Brown. il Elec Ry J 46:1087-9 N 27 '15
Gas weld rail bonding. J. F. Springer. il Munic J 38:254-6 F 25 '15
Goggles for gas welding and cutting. F. W. King. il Iron Age 95:295 F 4 '15
High speed steel tipped tools. J. W. Pike. il Ry Age (Meched) 89:590 N '15
High temperature flames in metal working. H. R. Swartley, jr. Iron Age 96:1122 N 11 '15
How time and money were saved by welding; oxy-acetylene process saved 13 days. il Foundry 43:168 Ap '15; Elec Ry J 45:517 Mr 13 '15; Ry Age (Mech ed) 89:197 Ap '15
Largest oxy-acetylene cast iron welding job. il Iron Tr R 56:1166 Je 10 '15
Methods of jointing aluminum. il Mach 21:470-3

Methods of jointing aluminum, il Mach 21:470-3

Methods of jointing aluminum, il Mach 21:4:0-3 F '15

New competitor of acetylene, J. F. Springer, Mach 21:903 Jl '15

Oxy-acetylene process for boiler work; report of committee of Master boiler makers' association, Ry Age (Mech ed) 89:309-12 Je '15; Same cond. Ry Age 58:1165-6 Je 4 '15

Oxy-acetylene process of welding, H: Cave. il diags Am Soc M E J 36:208-14 Je '14; Same cond. Eng M 47:750-2 Ag '14; Same cond. Eng M 47:750-2 Ag '14; Same cond. Eng M 47:750-2 Ag '14; Same cond. Eng M 47:132-200 Ag 26 '14

Oxy-acetylene welding, A. H. Waychoff, diags Sci Am S 79:132 F 27 '15

Oxy-acetylene welding and cutting equipment. S. W. Miller, il diags Mach 22:85-99 O '15

Oxy-acetylene welding at Great Falls, Mont. diags Eng & Min J 99:534 Mr 20 '15

Oxy-acetylene welding eliminates joints in gas mains; with cost figures, il Eng Rec 71: 182 F 6 '15

Oxyacetylene welding in mining, il diag Eng

182 F 6 '15

Oxyacetylene welding in mining, il diag Eng & Min J 99:393-7 F 27 '15

Oxyacetylene welding in pipe work, W. L. Roueche, il Power 41:808-11 Je 15 '15

Oxy-acetylene welding; International railway general foremen's association discussion. Ry Age (Mech ed) 89:425-6 Ag '15; Same cond. Ry Age 59:157 Jl 23 '15

Pipe welding at Panama Pacific exposition, il Metal Work 84:237-8 Ag 20 '15

Portable welding outfit for metallurgical works, il Met & Chem Eng 13:194 Mr '15

Possible substitute for acetylene in welding and cutting; by-product of natural-gas gasoline. J. F. Springer. Ry Age (Mech ed) 89: 529-30 O '15 line. J. F. S 529-30 O '15

Practice of the oxy-acetylene welding process. S. W. Miller. il Mach 22:106-17, 215-19 O-N

reparation of the work for oxy-acetylene welding. S. W. Miller. il Mach 22:101-5 O'15 Preparation Present status of the art, with references to recent articles. Sibley J 29:197-8 Mr '15

Recent developments in aluminum. E. V. Pan-nell. il Metal Ind n s 13:453-5 N '15

Safety in oxy-acetylene welding. Eng M 49: 596 Jl '15

Savings effected by using the Oxweld process in repair and reclamation work of varied character on ore vessels. Int Marine Eng 20:

Strength of welds made by the oxy-acetylene process; abstracts. A. Campion and W. C. Gray. Ind Eng 14:415-16 O '14; Am Soc M E J 37:355 Je '15 Successful acetylene aluminum welding. Metal Work 84:173-4 Ag 6 '15 Thermit welding. W. R. Hulbert. Am Gas Inst Pro 9:pt 2, 1182-4 '14 Thermit welding of camshafts. A. H. Jones. Met & Chem Eng 13:929 D 1 '15 Unusual oxy-acetylene weld. il Elec Ry J 45: \$98 My 8 '15 Welding broken machine parts. il Power 42: 687-8 N 16 '15 Welding copper and copper alloys by acetylene

Welding copper and copper alloys by acetylene methods. J. F. Springer. Ry Age (Mech ed) 89:367-9 Jl '15

Welding defective cores in paper mill by the Prest-O-Lite process. il Met & Chem Eng 13:770 O 15 '15

13:770 O 15 '15 Welding of high pressure mains. J. D. Shattuck. il diags Am Gas Inst Pro 9:pt 2, 945-1011 '14; Same abr. Am Gas Light J 102:54-5, 58-60, 66-9 Ja 25-F 1 '15; Discussion. Am Gas Inst Pro 9:pt 2, 1011-52.'14 Welding the joints of steel gas mains. il Eng N 73:233-4 F 4 '15

N 73:233-4 F 4 '15

Welding up scrap nickel anodes. il Elec R & Welding up scrap nickel anodes. il Elec R & Welec'n 66:1210-11 Je 26 '15; Same. Eng & Min J 100:19 Jl 3 '15; Same. Foundry 43: 283-4 Jl '15; Same. Met & Chem Eng 13:453-4 Jl '15; Same cond. Iron Age 95:1392 Je 24 '15; Same abr. Metal Ind n s 13:297 Jl '15

Welding water and gas mains. il Sci Am 112: 272+ Mr 20 '15

Why acetylene is the combustible gas used for autogenous welding. M. K. Dunham. Mach 21:1017-18 Ag '15

See also Electric welding; Solder and sol-

dering

Cost of oxy-acetylene welding, il Engineer 120:  $388\ {\rm O}\ 22$  ' 15

Welding, Electric, See Electric welding

Welfare work in industry Better living conditions for coke workers: improved relations between the H. C. Frick coke company and its employees. il Iron Age 95:48-9 Ja 7'15

Eliminating the dinner bucket. E. W. Pargny, il Iron Tr R 55:1089-91 D 10 '14

Humanitarian millwork in Greensboro, N. C. G. Dawe. il Am Ind 15:16-17 My '15

Industrial betterment, F. E. Cardullo, il Mach 22:171-201 N  $^{\prime}15$ 

Relief, compensation and pension system for ener, compensation and pension system for Westinghouse employees. Elec R & W Elec'n 65:1225 D 26 '14; Same. Elec W 64:1233-4 D 26 '14; Same. Iron Age 94:1497 D 31 '14; Same. Ry R 55:783 D 26 '14; Same. Iron Tr R 56:53 Ja 7 '15

Safety and welfare work in an electrical plant. C. L. Lucas. il Mach 22:210-14 N '15

Safety-first, first-aid and welfare work of the Colorado fuel and iron company. il Met & Chem Eng 13:234-8 Ap '15

Social service as a factor in good management. L. H. Burnett. Ind Eng 14:391-2 O '14

Teaching English to foreigners in industry. P: Roberts. Am Ind 16:24-6 O '15 Welfare and training of employees. O. L. Palmer. Am Gas Light J 103:332-3 N 22 '15

Welfare measures for employees. M. A. Welsh. Elec Ry J 45:841 My 1 '15 Welfare of workmen in European enterprises. C. Yan Langendonck. il Sci Am S 78:360-1 D

C. VE Welfare plans of Westinghouse company. Elec W 64:1233-4 D 26 '14

Welfare work at Glen White. G: D. Evans. 1 Colliery 35:473-5 Ap '15

Welfare work at Pitcairn, Pa., freight transfer. Ry Age 59:609-10 O 1 '15

Welfare work in a steel foundry; the Reading steel casting company. il Iron Age 96, 520-1 S 2 '15

Welfare work in New Mexico, R. McCune, Colliery 35:387 F '15

Welfare work in industry—Continued Welfare work of Tennessee company. L. No-land. Iron Tr R 56:1124; 57:356-8 Je 3, Ag 19 Welfare work of the Frick coke co. il plan Colliery 36:117-24 O'15

See also Factory restaurants; Hospitals, Factory; Industrial betterment; Profit sharing; Safety devices and measures

ell car of 200,000 lb. capacity, il diags Ry Age (Mech ed) 89:397-8 Ag '15

Well water. See Wells

Welland ship canal

Circumventing Niagara falls, B. Farrows, il map Sci Am S 78:387-8 D 19 '14 Construction of the Welland ship canal, W. A. Craick, il plan Int Marine Eng 20:154-6 Ap '15

'15 Large reinforced-concrete cribs used for Welland ship canal entrance. R. P. Johnson. il diags Eng Rec 71:458-60 Ap 10 '15 Reinforced-concrete floating caissons for the Welland ship canal. il diags Eng N 73:1122-4

Je 10 '15

Wells

Comparison of the water of Sulphur Springs with deep well and mine waters. C. E. Siebenthal. Econ Geol 9:762-3 D '14
Data on cost, depth and strata penetrated for water supply wells in Iowa. Eng & Contr 43:

water supply wells in Iowa. Eng & Contr 43: 76 Ja 27 15 Difficulties overcome in sinking a deep well. P. E. Green. diag Eng N 74:450-2 S 2 '15 Drilling 30-in. wells for irrigation. il Eng N 73: 924-5 My 13 '15 Effective water works publicity measure at Terre Haute. Eng & Contr 44:161-2 S 1 '15 Electric well-sounding instrument. L. W. Stocker. diags Eng N 73:444-6 Mr 4 '15 Engineering features of the Panama-Pacific international exposition. G. L. Bayley. il Am Soc M E J 37:585-91 O '15; Abstract. Eng water supply from wells in gravel. C. W. Wiles. Eng & Contr 43:449-50 My 19 '15; Discussion. 43:523 Je 9 '15 Ground water supplies. W: S. Johnson. il diags Boston Soc C E J 2:169-89 My '15; Same cond. Eng & Contr 44:29-31 Jl 14 '15; Discussion. Boston Soc C E J 2:283-90 S '15 Improved water from deep wells in northern Illinois. C. B. Williams. Am Water Works Assn J 2:410-15 Je '15; Same. Munic Eng 48: 306-7 My '15 Use. Measuring well-water levels under difficulties. H. W. Keith. diag Eng N 74:1037 N '25 '15

New well water supply of Galveston, Texas, H. G. Wheaton, il Eng & Contr 44:385-6 N 17 '15

Putting down into quicksand a dug well 10 ft. in diameter and 30 ft. deep. J. W. Ledoux. Eng & Contr 42:290 S 23 '14

Putting down large dug well in water bearing sand at Atlantic City, N. J. K. Allen. il Eng & Contr 42:355-6 O 14 '14

Recedence and pressure readings from sub-merged pumps. G. B. Covington, diag Power 41:473 Ap 6 '15

Selection of deep well pumping machinery.
D. A. Graham. Eng & Contr 43:104-6 F 3
15; Same. Engineer 120:164-5 Ag 13 '15;
Abstract. Eng N 73:184 Ja 28 '15; Abstract.
Eng Rec 71:204-5 F 13 '15

Success or failure of wells. R. E. Horton, Eng & Contr 44:138-9 Ag 25 '15

Surface pollution of a deep well water, J: W. Hill. Eng & Contr 44:386 N 17 '15

Syphoning water from series of drilled wells to a common pump well at Kokomo, Ind. O. O. Jones. plan Eng & Contr 43:191 Mr 3

Types and properties of deep well pun G: W. Bissell. Eng & Contr 44:33-4 Jl 14

Water supply, plumbing and sewage disposal for country homes. R. W. Trullinger, diags Dom Eng 72:194-7, 224-6 Ag 14-21 '15

See also Artesian wells; Drilling and boring (earth and rocks); Petroleum

Cleaning

Using compressed air to clean sand out of driven wells at Detroit, il Eng & Contr 44: 386 N 17'15

Wells, Artesian. See Artesian wells Welsbach mantles. See Gas mantles

Wenatchee, Washington

### Streets

Wood block pavement in the City of Wenat-chee, Wash. F. J. Sharkey. il Eng & Contr 44:300-2 O 20 '15

West, Thomas Dyson, 1851-1915
Foundry industry loses leader in accident, por
Foundry 43:287-8 JI '15
Sketch, por Iron Age 95:1426 Je 24 '15; Iron
Tr R 56:1335-6 Je 24 '15; Met & Chem Eng
I3:462 JI '15
Tribute to memory of Thomas D. West, P. L.
Simpson, Foundry 43:325+ Ag '15

Engineering works of the West. il Eng Rec 72: 261-4 Ag 28 '15
Features of engineering in the West. H. F. Stratton. il maps Sibley J 29:139-49, 184-90, 223-7 F-Ap '15

See also Pacific coast

# Description and travel

Eothen! C: H. Whitaker. il Am Inst Arch J

West Jersey and seashore railroad Third rail and trolley system. J. V. B. D il diags Am Inst E Pro 34:1237-53 Je Abstract. Elec Ry J 46:58-9 Jl 10 '15

West Virginia mining institute Annual meeting, Huntington, Dec. 10 and 11, 1914. Colliery 35:387-8 F '15 West Virginia state association of master

plumbers 14th annual convention, Charleston, March 16-17. Dom Eng 70:414-15 Mr 27'15

Western association of electrical inspectors 10th annual meeting, Minneapolis, Minn., 26. Elec R & W Elec'n 66:257-61 F 6 '15

Western association of short line railroads Bad features of the present laws regulating mail carriage: letter to congressmen. Ry Age 58:58 Ja 8 '15

Western electric company Western electric developments in 1914. Elec R & W Elec'n 66:45-7 Ja 2 '15

Western newspaper union

Western newspaper union plant in Chicago. T: Wilson. il plan Power 41:2-5 Ja 5 '15 Western newspaper union solves problem of moving its large plant without interrupting business. J. T. Elliott. il Inland Ptr 54:406-8

Western red cedar association
9th annual meeting. Elec R & W Elec'n 66:
164 Ja 23 '15

Western society of engineers
Annual dinner speeches. W Soc E J 20:56-95
Ja '15

A 15 45th annual meeting, Chicago, Jan. 13. Elec R & W Elec'n 66:165 Ja 23 '15 Founding of the Western society of engineers. W. Katte. W Soc E J 20:339-40 Ap '15

Western states water power conference Ferris bill at water power conference assailed. Eng Rec 72:429+ O 2 '15 State control of water-power. Elec W 66:682, 734-6 S 25-O 2 '15

Westinghouse electric & manufacturing co.
Annual report for the fiscal year ended March
31, 1915. Elec W 65:1286-7 My 22 '15
Relief, compensation and pension system for
Westinghouse employees. Elec R & W Elec'n
65:1225 D 26 '14; Same. Elec W 64:1233-4 D
26 '14; Same. Iron Age 94:1497 D 31 '14;
Same. Ry R 55:783 D 26 '14; Same. Iron Tr
R 56:53 Ja 7 '15

Westinghouse electric developments in the year 1914. Elec R & W Elec'n 66:43-5 Ja 2'15

Westminster hall, London

Reinforcement for the roof timbers of West-minster hall, England, F. Baines, Eng & Contr 42:172-5 Ag 19 '14

Weston, Edward, 1850-Inventions, L. II. Backeland, por Sci Am S 79:108-9 F 13 '15

Ninth Perkin medal presentation. Eng & Min J 99:234-5 Ja 30 '15
Perkin medal award. por J Ind & Eng Chem 7:243-54 Mr '15
Presentation of the Perkin medal to Edward Weston. por Met & Chem Eng 13:111-16 F

Wharves

Corrosion of steel wharves at Kowloon: abstract, S. H. Ellis, diags Am Soc M E J 37: 123-4 F '15

Experiences with concrete in the republic of Panama. A. P. Crary, il diags Eng N 73:214-16 F 4 '15

Municipal steamboat landing at Peoria, Ill. diags plan Eng N 73:15 Ja 7 '15 Municipal wharves and sheds at Los Angeles. il diags Eng N 73:824-5 Ap 29 '15 Novel bulkheads for wharves at Jacksonville. Il. D. Mendenhall. diags map Eng N 74: 772-4 O 21 '15

See also Docks; Piles and pile driving; also names of cities, subhead Wharves

Effect of certain organic compounds on wheat plants in the soil. F. W. Upson and A. R. Powell. il J Ind & Eng Chem 7:420-2 My '15 See als : Flour

Wheatstone bridge
Equivalence of Wheatstone bridge to three
parallel circuits. A. H. Adams. Elec W 66:
406 Ag 21 '15
Wheatstone bridge for resistance thermometry. C. W. Waidner and others. il diags U S
Bur Stand Bul 11:571-90 My 27 '15; Summary.
J Fr Inst 178:777 D '14

Wheel chairs, Electric Electric rolling chairs, il Eng N 73:1094 Je 3

Evolution of the wheel-chair, il Sci Am 112: 497+ My 29 '15

Wheelbarrows

Moving brick by wheelbarrow. W. B. Conant. il Eng N 74:701 0 7 15
Safe wheelbarrows and trucks. diag Ind Eng 15:43-4 F '15; Same. Foundry 43:265-6 Jl '15; Same. Iron Tr R 57:396+ Ag 26 '15; Same cond. il Am Ind 15:sup1-4 Jl '15

Wheels

Pressed steel wheel for factory trucks. il Iron Age 96:1183 N 18 '15

Standardization of chilled iron crane wheels; abstracts. F. K. Vial. diags Am Soc M E J 37:147-51 Mr '15; Iron Tr R 55:1083-7+ D 10 '14

Nee also Automobiles—Wheels; Axles; Car wheels; Grinding wheels; Machinery; Motor trucks—Wheels; Motor vehicles—Wheels; Tires (automobile); Turbines; Water wheels

Whetstones

Whetstones in the United States national museum. Sci Am S 79:275 My 1 '15

White cedar association, Northern. See Northern white cedar association

White mountains
Improving White mountain forests. W: L.
Hall. il Am For 21:117-26 F '15

White pine. See Pine

White Plains, New York

## Architecture

Winifred Masterson Burke relief foundation; views and plans. Brickb 24:pl 91-6 Jl 15

### Hotels

Gedney Farms. Arch Rec 38:696 D '15 Whitney, Willis Rodney, 1868-Sketch, por Eng M 50:202-3 N '15

Whole wheat flour. See Flour Wilkinsburg, Pennsylvania

### Railroads

Pennsylvania track elevation through Wil-kinsburg, il plans Ry Age 59:654-8 O 8 '15

Williams, Richard Richardson, 1843-1915 Sketch. por Iron Age 96:801 O 7 '15

Willow, See Osiers Wilmington, Delaware

Water supply

Water supply at Wilmington, Delaware. E. M. Hoopes, jr. and J. M. Caird. il Am Water Works Assn J 1:111-34 Mr '14; Same cond. Eng & Contr 42:210-12 Ag 26 '14

Winchester, England
Winchester in war-time. H: Winslow. il Am
Inst Arch J 2:561-4 D '14

Wind bracing. See Wind pressure

Wind motors

Wind motors; abstract. M. Drzewiecki. Am Soc M E J 37:403 Jl '15

Wind power. See Windmills

Wind pressure

Vind pressure

Notes on wind pressure. R. G. Keevill. Engineer 119:393 Ap 16 '15

Structural damage slight in New Orleans storm. J. F. Coleman and W. H. P. Creighton. Eng N 74:765-6 O 14 '15

Waste of metal in mill-building columns. C. L. Christensen. Eng N 73:590-1 Mr 25 '15

Why suction should be considered in designing for wind stresses. A. Smith. Eng N 73:594 Mr 18 '15

Wind-bracing requirements in municipal building codes. R. Fleming. Eng N 73:485-7 Mr 11 '15

Wind pressure formulas and their experimental

ing codes. R. Fleming. Eng N 73:485-7 Mr 11 '15
Wind pressure formulas and their experimental basis. R. Fleming. Eng N 73:160-3 Ja 28 '15
Wind pulls rivets in stack brace. il Power 42:426 S 21 '15
Wind stresses and factors of safety. R. D. Coombs. Eng N 73:359 F 18 '15
Wind stresses in highway bridges. R. Fleming. Eng N 73:372-5 F 25 '15
Wind stresses in railroad bridges. R. Fleming. Eng N 73:372-5 F 25 '15
Wind stresses in skew bridges. J. P. J. Williams. Eng N 73:622-6 Ap 1 '15
Wind stresses in steel mill-buildings. R. Fleming. diags Eng N 73:210-14 F 4 '15
Wind stresses in the steel frames of office buildings. A. Smith. tables pls W Soc E J 20: 311-61 Ap '15
Wind stresses in the steel frames of office buildings. W. M. Wilson and G. A. Maney. tables Ill U Eng Exp Sta Bul 80:1-88 '15; Abstract. Eng Rec 72:231-2 Ag 21 '15
Wind stresses in the steel frames of office

Wind stresses in the steel frames of office buildings; with discussion. W. M. Wilson. tables pls W Soc E J 20:365-90 Ap '15

Wind resistance. See Air resistance

Wind shields

Wind-shield cleaner invented by Prince Henry. il Sci Am 113:84 Jl 24 '15

Wind wheels. See Windmills

Windmills

Small aero-electric plant. E. H. Williamson, jr. il Sci Am 113:200-1 S 4 '15

Window dressing. See Show windows

Window frames

Details of pocket window frame. W. S. Wilkin, diags Bldg Age 37:56-7 Ag '15

Window frame with glass louvres, diags Bldg Age 37:73-4 Ja '15

Window seats

Details of seat for a bay window. J: Wavrek, jr. diags Bldg Age 37:33-4 Ag '15

Windows Casement windows: a comparison with double hung windows. Bldg Age 37:66 Ja '15

Planning for daylight and sunlight in buildings; with discussion. L. B. Marks and J. E. Woodwell, bibliog il diags Illum Eng Soc 9 643-86 no 7 '14

hort method for calculating glass surface E. M. Shealy. Dom Eng 72:286 S 4 '15

Wind leakage, F. K. Davis, Heat & Ven 12:48-Ap '15

Window over entrance, custom house, Salem Mass.; measured drawing. G. Robb. Brickl 24:pl 9 S '15 See also Bay windows; Glass; Show win

dows

Windows, Cloth. See Cloth windows

Wine

Contributions of the chemist to the wine industry, C: S. Ash. J ind & Eng Chem 7:273dustry. (

Winnipeg, Manitoba

Water supply

Construction features of the Greater Winnipeg water works J. H. Fuertes, diags Eng & Contr 44:377-80 N 10 15 Curves on Winnipeg aqueduct built with straight sections of forms, diags Eng Rec

urves on straight

Direct control over construction materials is feature of 100-mile Winnipeg aqueduct, il Eng Rec 71:594-6 My 8 '15

Progress on the greater Winnipeg aqueduct, il Eng N 73:230-1 F 4 '15

Winter construction

Errecting a building under a tent in winter. il Eng N 73:394 F 25 '15

See also Concrete construction in winter

Wire

Copper wire tables. U S Bur Stand Circ 31: 114

Effective resistance and inductance of iron and bimetallic wires. J: M. Miller. diags U S Bur Stand Bul 12:207-67 N 8 '15
Forming a wire in the automatic screw machine. E. Whitney. diags Mach 21:294-5 D

Handy wire straightener, diag Eng & Min J 100:881 N 27 '15 Preventing kinking in handling wire from coils, J. G. Koppel, il Elec Ry J 46:66 Jl 10

ests of splices in galvanized iron wire. T. Croft. il Elec R & W Elec'n 67:716-17 O 16 Tests

Wire products and wire-working machines. E. R. Miner. il Mach 21:389-92 Ja '15

See also Barbed wire entanglements; Cables; Electric wire and wiring

Wire, Trolley. See Trolley wire

Wire rope

Armored wire rope. Eng & Min J 100:191 Jl 31

Therefore were rope. Eng & Min J 100:191 Ji 31 '15'

Design and construction of aerial ropeways. diags Engineer 120:79-81 Jl 23 '15; Excerpt (Traction rope). Eng & Min J 100:475 S 18 '15: Excerpt (Track ropes). Eng & Min J 100:518 S 25 '15

Large-sized drums and sheaves give wire rope economy. diag Eng Rec 72:582 N 6 '15

Oil drillers develop good wire rope practice—do not jerk loads. il Eng Rec 72:673 N 27 '15

Steel-wire hoisting ropes; rule for finding the load stress and the required diameter. F. W. Sperr. Colliery 35:606-7 Je '15

Wire cables of various types and materials tested by U. S. Bureau of standards. il diag Eng Rec 72:567-8 N 6 '15

Wire rope. Sci Am 112:639 Je 26 '15

Wire rope clips should be put on with saddle next main part. Eng Rec 72:269 Ag 28 '15

See also Cables

See also Cables

Wire-working machinery
New heavy wire drawing machine. il Iron Tr
R 57:404 Ag 26 '15
Wire bending fixture. G: P. Breitschmid. diag
Mach 21:408 Ja '15
Wire products and wire-working machines.
E. R. Miner. il Mach 21:389-92 Ja '15

Wireless telegraph

Vireless telegraph
Auxiliary radio equipment on steamer Howard
tested. Elec R & W Elec'n 67:979 N 27 '15
Baltimore municipal White truck has wireless
equipment, il Automobile 31:1023 D 3 '14
Commercial wireless apparatus, il diag Elec W
66:882-3 O 16 '15

66:882-3 O 16 '15
Communicating over great distances; the invention of the telegraph, telephone and wireless telegraphy. il Sci Am 112:573+ Je 5 '15
Conditions affecting the variations in strength of wireless signals. E. W. Marchant. diags Inst E E J 53:329-40 Mr 1 '15; Abstract. Eng M 49:256-7 My '15; Summary. Elec R & W Elec'n 66:445 Mr 6 '15; Discussion. Inst E E J 53:340-8 Mr 1 '15

Considerations on the sensitiveness of the heterodyne receiver in wireless telegraphy. M. Latour. Elec W 65:1039 Ap 24 '15

Construction of a multiple tuner; complete working drawings and specifications for the amateur, C. L. Sears, diags Sci Am S 80:68-70 Jl 31 '15

To JI 31 '15

Continuous waves in long distance radio telegraphy. L. F. Fuller, bibliog il Am Inst E E Pro 34:567-85 Ap '15; Abstract, with discussion. Elec R & W Elec'n 66:736-7 Ap 17 '15; Abstract, with discussion. Elec W 65:983-4 Ap 17 '15; Discussion. Am Inst E E Pro 34: 2927-40 D '15

Device for receiving wireless time signals. il diag Elec W 65:318-19 Mr 27 '15

Directing electromagnetic waves. A. Artom. Elec W 66:351-2 Ag 14 '15

Discussion of the proposed work to be undertaken by the International commission on wireless telegraphy. W. Duddell. Elec W 65: 347-8 F 6 '15

Do the waves of wireless telegraphy affect

347-8 F 6 '15 Do the waves of wireless telegraphy affect organic life? C. Abel-Musgrave. Elec W 66: 710 S 25 '15 Double-audion type of receiver; description

organic life? C. Abel-Musgrave. Elec W 66: 710 S 25 '15

Double-audion type of receiver; description of the equipment used for the reception of continuous radiotelegraphic waves at station in North Dakota. A. H. Taylor. Elec W 65:652-5 Mr 13 '15

Electrical constants of antennas. L: Cohen. diag Elec W 65:286-8 Ja 30 '15

Function of the earth in radio-telegraphy. J. A. Fleming. Sci Am S 79:29 Ja 9 '15

Home-made wireless photo-recording set. diags Sci Am S 80:92-3 Ag 7 '15

Longitudes by wireless telegraphy. F. B. Littell. Sci Am 112:382-3 Ap 24 '15

Photo-electricity; the intimate relations of light and electricity. J. A. Fleming. Sci Am S 80:18-19 J1 10 '15

Pure electron discharge and its applications in radio telegraphy and telephony. I. Langmuir. diags Gen Elec R 18:327-39 My '15; Abstract. Elec W 65:1247 My 15 '15

Quantitative experiments in radiotelegraphic transmission. L. W. Austin. U S Eur Stand Bul 11:69-86 N 15 '14

Radio generator for amateurs. F: E. Ward. il Sci Am S 30:36 J1 17 '15

Radio-telegraphic investigations; committee report of section A of the British association; abstracts. Engineer 120:279 S 17 '15; Elec R & W Elec'n 67:675-6 O 9 '15

Radiotelegraphy without elevated antennas. C: A. Culver and J: A. Riner. Elec W 65: 723-6 Mr 20 '15; Abstract. Eng M 49:258-9 My '15

Recent advances in wireless measuring instruments.

Recent advances in wireless measuring instru-ments. H. T. Wade. il diags Sci Am 113: 356 O 23 '15 Recent electrical progress. Engineer 119:34 Ja

Recent electrical progress. Engineer 119:34 Ja 8 '15
Records of radio time signals made with a physiological recorder, C. W. Waggoner. il Sci Am S 79:152 Mr 6 '15
Resistance of radiotelegraphic antennas. Elec R & W Elec'n 67:427, 905 S 4, N 13 '15
Review of some notable developments of the past year. Sci Am S 79:99 F 13 '15
Sound wheel, a novel wireless detector. il Sci Am 112:384 Ap 24 '15
Storage batteries for radio service. Elec R & W Elec'n 66:352 F 20 '15
Strength of radio signals. Elec R & W Elec'n 66:357 Ag 21 '15
Ultraudion detector for undamped waves. L. de Forest. il Elec R & W Elec'n 66:357-8 F 20 '15; Same. Elec W 65:465-6 F 20 '15
Washington-Paris longitude by radio signals; a valuable application of wireless communication. F. B. Littell and G. A. Hill. Sci Am S 79:266-7 Ap 24 '15
Wireless inventions and the press; portable apparatus. Sci Am 113:462 N 27 '15
Wireless-telegraphy antenna for long waves.

Wireless-telegraphy antenna for long waves. diags Elec W 66:412 Ag 21 '15 Wireless transmission. Sibley J 29:109 Ja '15; Same. Sci Am S 79:83 F 6 '15

Wireless transmission of energy, E. Thomson, diags Sci Am S 79:252-3, 270-1 Ap 17-24 '15; Same, Gen Elec R 18:316-27 My '15

Year in the electrical industry. Elec R & W Elec'n 66:6 Ja 2 '15

See also Electric waves

Wireless telegraph for railroads
Radio telegraphy and telephony for railroads.
J: L. Hogan, jr. il diags Elec W 66:570-2 S

11 '15
Wireless telegraph and telephone on the D. L. & W. R. R.; abstracts. L. B. Foley. il Ry R 56:491-3 Ap 10 '15; Ry Age 58:378 F 26 '15; Eng M 49:253-6 My '15
Wireless telegraph and wireless telephone on the Union Pacific R. R. il Ry R 55:587-91 N 14 '14; Abstract. Eng M 48:585-8 Ja '15
Wireless telegraphy and railroading. H. D. Schedler. il Sci Am 112:338+ Ap 10 '15

Wireless telegraph in war

Our army wireless automobiles. C. H. Claudy. il Sci Am 112:478 My 22 '15
Portable radio equipment of the United States army. il Elec W 66:184 Jl 24 '15
Radio telephone and telegraph equipment on a motorcycle. il Sci Am 112:293 Mr 27 '15
Science in the war and after the war. J. A. Fleming. Sci Am S 80:339 N 27 '15

Wireless telegraph stations

Vireless telegraph stations
Clean-up work after erecting three 600-ft. radio towers. Eng N 74:28 Jl 1 '15
Factors determining the efficiency of radio stations. R: Pfund. Eng M 49:257-8 My '15
Foundations for high towers at Darien, C. Z. I. W. Dye. il diag Eng N 73:1178-9 Je 17 '15
Method of erecting Marconi masts. L. H. Peebles. il diag Eng N 73:1132-4 Je 10 '15
Radio station for Society islands near completion. Elec R & W Elec'n 67:986 N 27 '15
600-ft. self-supported radio towers at Darien, C. Z. I. W. Dye. il diag Eng N 73:1228-31
Je 24 '15
Towers for radio-telegraph stations il diags.

Towers for radio-telegraph stations. il diags Engineer 119:427-8 Ap 30 '15 Trouble near wireless stations. Elec R & W Elec'n 67:900 N 13 '15

Wireless telephone
Colin-Jeance wireless telephone apparatus. il
Elec R & W Elec'n 66:1168 Je 19 '15
Device for wireless telephony. Iron Age 96:237
JJ 29 '15

JI 29 '15
First public use of the de Forest lamp as an oscillating audion. L, de Forest. il Elec R & W Elec'n 67:908 N 13 '15
Future of radio telephony. E. H. Colpitts. il Sci Am 113:485+ D 4 '15
Latest steps in radio telephony. H. Pender. il map Eng M 50:373-81 D '15
Long distance wireless telephony; distances achieved in recent tests. map Sci Am 113: 319 O 9 '15
Marconi's wireless telephone. J. A. White il

319 0 9 15
Marconi's wireless telephone. J. A. White. il
Sci Am 112:450 My 15 '15
New promise for wireless telephony; invention
of Professor Pupin. Eng M 50:444 D '15
Principles of radio-telephony. J. L. Hogan, jr.
il Sci Am 112:286+ Mr 27 '15

Pure electron discharge and its applications in radio telegraphy and telephony. I. Lang-muir. diags Gen Elec R 18:327-39 My '15; Ab-stract. Elec W 65:1247 My 15 '15

Radio telegraphy and telephony for railroads. J: L. Hogan, jr. il diags Elec W 66:570-2 S 11 '15

Radiotelegraphy and radiotelephony. J. L. Hogan, jr. Elec W 65:27-8 Ja 2 '15
Radiotelephony. W. C. White. Gen Elec R 18: 38-41 Ja '15; Same. Sci Am S 80:146-7 S 4 '15 Voice carried 4900 miles by radio. il map Elec W 66:788-91 O 9 '15

Wireless auxiliary to telephone system. il Elec R & W Elec'n 66:1169 Je 19 '15

Wireless telegraph and telephone on the D. L. & W. R. R. L. B. Foley, il Ry R 56:491-3 Ap 10 '15

Wireless telegraph and wireless telephone on the Union Pacific R. R. il Ry R 55:587-91 N 14 '14; Abstract. Eng M 48:585-8 Ja '15

Wireless telephony. Sci Am S 79:121 F 20 '15

Wireless waves
Starting an automobile by wireless waves.
Sci Am 113:323 O 9 '15

Wisconsin

Increased taxation in Wisconsin and its effect upon public service companies. E. Gruhl. Elec W 65:259 Ja 23 '15; Same. Elec Ry J 45:234 Ja 30 '15

Highway commission

Organization and standards of the Wisconsin highway commission, il diags Eng & Contr 42:398-403 O 28 '14

Industries and resources

Mining and milling of lead and zinc ores in the Wisconsin district, Wisconsin. C. A. Wright, il plan U S Bur Mines Tech Pa 95:

Wisconsin electrical association 7th annual convention, Milwaukee, Jan. 20-22. Elec Ry J 45:232-5 Ja 30 '15 7th annual convention, Milwaukee, Jan. 21 and 22. Elec R & W Elec'n 66:206-9 Ja 30 '15

Wisconsin master plumbers association
Annual convention, Milwaukee, Wis., January
19-20, 1915. Metal Work 83:189-91 Ja 29 '15
21st annual convention in Milwaukee. Dom Eng
70:148-50 Ja 30 '15

Wisconsin. University
University promotes engineering work without
displacing consulting engineer. G: R. Bascom. Eng Rec 72:47-8 Jl 10 '15 Witwatersrand. See Gold mines and mining-

Wolframite Wolframite in lower Burma. E. M. Lefroy. Eng & Min J 99:684 Ap 17 '15

Employment

British and French women make shells; photographs. Iron Tr P. 57:686-7 O 7 '15
Efficiency of French women as railway workers. W. S. Hiatt. il Ry Age 59:943-5 N 19 '15
Employment of women as machinists. il Engineer 120:218 S 3 '15; Excerpt. Eng M 50: 451 D '15

451 D '15
Employment of women in engineering workshops. Engineer 120:181-2 Ag 20 '15
Labour after the war—employment of women; abstract of report to the British association. Engineer 120:292-3 S 24 '15
Tramways during war times. J. Dalrymple. Elec Ry J 46:860 O 23 '15
Women as successful master plumbers. B. H. Albee. il Dom Eng 73:71-2 O 16 '15
Women conductors for London. Elec Ry J 46: 962 N 6 '15

962 N 6 15 Women conductors in Berlin, il Elec Ry J 46: 675 O 2 '15 Women fast taking the places in tramway service of men needed at the front. Elec Ry J 46:33 Jl 3 '15 Women railway employees in England, il Ry Age 58:1120 My 28 '15

Wood, Henry A. Wise, 1865-Sketch. por Eng M 50:213 N '15

Wood

ood
Lightest known wood. Sci Am S 79:96 F 6 '15
Modern uses of wood. H. von Schrenk. il
diags W Soc E J 20:27-44; Discussion. 20:
44-51 Ja '15
Musical woods. Sci Am S 78:355 D 5 '14
Tulip or yellow poplar tree. il Am For 21:
833-40 Ag '15
Use of native woods for interior finish. C. M.
Price. il Brickb 24:217-22, 239-42, 285-9 S-N
'15

See also Forests and forestry; Lumber; Poles: Timber; Trees; also names of trees, e.g. Cedar, Chestnut, Cypress, Douglas fir, Hemlock, Maple, Pine, Redwood

Testing

Mechanical properties of teak wood; abstract.
A. Weiskopf, Am Soc M E J 37:289-90 My '15
Rocky mountain mine timbers, N. de W. Betts,
diag U S Agric Bul 77:1-31 '14
Strength tests of structural timbers treated
by commercial wood-preserving processes.
H. S. Betts and J. A. Newlin, U S Agric
Bul 286:1-14 '15
Test of long-submerged hemlock timber. T. R.
Lawson, il Eng N 73:159 Ja 28 '15

Wood as food Edible wood. Sci Am 113:171 Ag 21 '15 Edible wood. Sci Am S 80:144 Ag 28 '15

Wood as fuel Wood and coal as fuel for steam boilers. H. B. Reynolds. tables Sibley J 30:14-20 O '15 Wood as fuel-Continued

Wood as a fuel for mine power plants. E. A. Holbrook, diags Eng & Min J 99:645-7 Ap 10 '15

Wood ashes

Potash from wood and plant ashes. H. Bradley. diag Met & Chem Eng 13:841-6 N 15 '15

Wood borers. See Borers (animals)

Wood distillation

Chemical engineering of the hardwood distillation industry, J. It. Withrow, J Ind & Eng Chem 7:912-13 N '15; Same, Met & Chem Eng 13:797-9 N 1 '15
Composition of wood turpentine, M. Adams, J Ind & Eng Chem 7:957-60 N '15
Contributions of the chemist to the hardwood distillation industry, S. W. Katzenstein, J Ind & Eng Chem 7:940-2 N '15
Distillation of Douglas fir at high temperatures, B. Tremper, J Ind & Eng Chem 7:926-7 N '15
Hardwood distillation industry in America.

tures. B. Tremper. J Ind & Eng Chem 7:926-7 N '15
Hardwood distillation industry in America. E: H. French and J. R. Withrow. il Met & Chem Eng 13:30-9 Ja '15; Same. J Ind & Eng Chem 7:47-55 Ja '15; Discussion. 7:55-6, 899-900 Ja, O '15
Oils of the coniferae. A. W. Schorger. il J Ind & Eng Chem 6:723-7, 809-10, 893-5; 7:24-6 S-N '14, Ja '15
Preliminary experiments on the effect of temperature control on the yield of products in the destructive distillation of hardwood. R. C. Palmer. diags J Ind & Eng Chem 7; 663-9 Ag '15
Steam generation in a wood-distilling plant. L. Eddy. diag Power 41:846 Je 22 '15
Waste pine wood utilization. J: E. Teeple. J Ind & Eng Chem 7:929-30 N '15
What chemistry has done to aid the utilization of wood. S. F. Acree. J Ind & Eng Chem 7:913-15 N '15
Yield of by-products from destructive distilla-

Yield of by-products from destructive distilla-tion of some western conifers. H. K. Benson and M. Darrin. J Ind & Eng Chem 7:916-18

Wood finishing

Care and use of the cabinet scraper. C: A. King, diags Bldg Age 37:37-8 Jl '15
Education in woodfinishing. W: P. Comstock. il Arch & Bldg 47:65-6 F '15
Electric equipment for painting without a brush. il Elec W 66:1050 N 6 '15
Electrically operated rubbing and polishing machine. il Elec R & W Elec'n 67:906 N 13 '15

Features of the home of redwood. J. H. Browne, il Bldg Age 37:38-9 Ag '15 Hints on painting exterior woodwork, il Bldg Age 37:65-6 Jl '15

Wood oil, Chinese. See Chinese wood oil

Wood pipes. See Pipes, Wood

Wood preservation

Air seasoning of ties. A. H. Noyes. Ry R 56:111 Ja 23 '15

Ja 23 '15

American railway engineering association committee report. Ry R 56:399-400 Mr 20 '15

American wood preservers' association: abstracts of papers presented at the 11th annual convention, Chicago, Jan. 19-21. Eng Rec 71: 105-8, 144-5 Ja 23-30 '15

American wood preservers' association 11th annual convention, Chicago, Jan. 19-21. Elec Ry J 45:181-2 Ja 23 '15

American wood preservers' convention at Chicago, Jan. 19-21, 1915. Ry Age 58:158-63 Ja 22 '15

'15
American wood preservers' convention; modifications made in committees' recommendations. Elec Ry J 45:237 Ja 30 '15
Annual meeting of the American wood preservers association. Eng N 73:182-3 Ja 28 '15
Behavior of treated ties in alkali soils. Elec Ry J 46:1002 N 13 '15
Carbolineum and creosote. H. H. Alcock. Am Gas Light J 103:58-9, 125 Jl 26, Ag 23 '15

Carbolineum and creosote. S. R. Church, Am Gas Light J 103:108 Ag 16 '15

Creosoting of cross ties as practiced by American railroads. A. C. Steinmayer. il Assn Eng Soc J 54:110-20 Mr '15

Economical use of wood preservation of timber E. W. Bright. Elec Ry J 44:1351-2 D 19 '14

Effect of steaming process of creosoting on strength of Oregon fir piling; abstracts. H. B. Macfarland, Eng Rec 70:487-8 O 31 '14; Eng & Contr 42:481-3 N 18 '14; Summary. Eng N 72:863 O 29 '14; Ry Age 57:1156 D 15

'14
Effect of the war on timber preservation. Ry
Age 58:843-5 Ap 16 '15
Effect of zinc chloride on timber strength.
Elec Ry J 46:73 Jl 10 '15
Effectiveness of wood preservatives. Ry R 57:
79 Jl 17 '15
Experiences in creosoted wood block paving.
E. R. Dutton. Good Roads n s 10:266-7 N 6
'15 to with creests. R. G. Reilly, Ry R.

Mixing tar with creosote. P. C. Reilly. Ry R 56:242-7 F 20'15
Modern application of wood preserving methods. E. A. Sterling. Am For 21:878-9, 937-8
Ag-S'15

Ag-S '15
More about wood preservatives. E. A. Sterling.
Ry Age 57:1135-6 D 18 '14
Only creosote properly applied withstands
teredo. Eng Rec 71:209-10 F 13 '15
Preservation of mine timber. H. A. Appel.
Colliery 35:481-3 Ap '15
Preservative treatment of timber. H. F. Weiss
and C. H. Teesdale. Elec Ry J 46:625-6 S
25 '15
Preservative treatment of timber.

25 '15
Preservative treatment of timber. J. M. Goldman. Colliery 35:314-17 Ja '15
Results obtained from the preservative treatment of telephone poles. F. L. Rhodes and R. F. Hosford. bibliog il Am Inst E E Pro 34:2343-87 O '15; Abstracts. Elec Ry J 46: 879 O 23 '15; Elec W 66:1031 N 6 '15
Specification for a coal-tar creosote solution. H. Von Schrenk and A. L. Kammerer. Eng Rec 71:144 Ja 30 '15; Same. Ry Age 58:160-1 Ja 22 '15
Specification for a creosote-coal tar solution.

Ja. 22 '15 Specification for a creosote-coal tar solution. Eng Rec 71:398 Mr 27 '15 Specification for zinc chloride treatment. W. F. Goltra. Ry Age 58:459 Mr 12 '15 Strength tests of structural timbers treated by commercial wood-preserving processes. H. S. Betts and J. A. Newlin, U.S. Agric Bul 286: 1-14 '15

1-14 '15
Tests of wood preservatives. H. F. Weiss and C. H. Teesdale. il U S Agric Bul 145:1-20 '15
Tie preservation on the Baltimore & Ohio R. R.; abstracts. F. J. Angier. Ry Age 59: 537-8 S 17 '15; Eng & Contr 44:396-7 N 17 '15; Ry R 57:630-3 N 13 '15
Tie treating on the Boston & Worcester street railway. il Elec Ry J 45:678-9 Ap 3 '15
Tie treatment in British India. il Ry R 56: 248-9 F 20 '15
Tayicity of various wood preservatives. R. M.

Toxicity of various wood preservatives. R. M. Fleming and C. J. Humphrey. il J Ind & Eng Chem 7:652-8 Ag '15
Treated timber for factory construction. Eng N 73:183-4 Ja 28 '15

Treated timber for factory construction. F. J. Hoxie. Eng Rec 71:107-8 Je 23 '15; Same. Eng & Contr 43:563-4 Je 23 '15; Same cond. Eng M 48:896-8 Mr '15

Wood preservation statistics. Ry Age 58:1447-8 Je 18 '15

Wood preservers' convention, Jan. 19-21, 1915. Ry R 56:115-17 Ja 23 '15

Wood preserving department. See monthly numbers of the American forestry

Work and some accomplishments of the forest products laboratory, Madison, Wis. H. F. products laboratory, Madison, V Weiss. W Soc E J 19:946-51 D '14

See also Creosoting; Dry rot

Wood preservers' association, American. See American wood preservers' association Wood pulp

Evolution of the pulp and paper industry. T: J. Keenan, Sci Am S 80:131 Ag 28 '15

Wood using industries Annual consumption of wood. Am For 20:897

Wood waste

Manufacture of ethyl alcohol from wood waste; the hydrolysis of white spruce. F. W. Kress-mann. J Ind & Eng Chem 7:920-2 N '15 Manufacture of ethyl alcohol from wood waste; western larch as a raw material. F. W. Kressmann. J Ind & Eng Chem 7:922-3 N '15

Wood waste—Continued

Methods of disposing of refuse from woodworking plants. F. O. Alton. Elec R & W
Elec'n 67:556-7 S 25 '15

Tannin content of Pacific coast conifers. H. K.
Benson and T. G. Thompson, il J Ind & Eng
Chem 7:915-16 N '15

Use of amponium bydrovide for the extraction

Chem 7:915-16 N '15
Use of ammonium hydroxide for the extraction of rosin from wood. H. K. Benson and H. N. Crites. J Ind & Eng Chem 7:918-20 N '15
Waste pine wood utilization. J: E. Teeple. J Ind & Eng Chem 7:929-30 N '15
What chemistry has done to aid the utilization of wood. S. F. Acree. J Ind & Eng Chem 7: 913-15 N '15
Yield of by-products for destructive distillation of some western conifers. H. K. Benson and M. Darrin. J Ind & Eng Chem 7:916-18
N '15 15

See also Sawmills: Wood distillation

Woodcraft

Boy scouts and forests. K. W. Woodward. il Am For 21:103-9 F '15

Woodfinishing. See Wood finishing

Woodlots

Woodlot forestry, S. B. Detwiler, il Am For 21:571-4 Ap '15

Woodward, Robert Simpson, 1849-Sketch. por Eng M 50:210-11 N '15

Woodwork

Hints on the use of glue. W. H. Wilkin. Bldg Age 37:63-4 N '15

See also Cabinet making; Furniture; Wood finishing

Woodworking machinery
Electricity in the lumber industry. E. F. Whitney, il diags plans Am Inst E E Pro 33:182362 D '14

Now wooden barrel machine il diag Iron Age 95:794-5 Ap 8 '15 Wood-working plant at a ship-building yard. il diags Engineer 120:230-2, 243-5, 250 S 3-10

See also Lathes; Planing machines; Sawmills; Saws

mills; Saws

Woodworking shops
Economical motor service in lumber mill. il
Elec W 65:944 Ap 10 '15
Electricity in woodworking plants. il Elec R
& W Elec'n 66:893-7 My 15 '15
Methods of disposing of refuse from woodworking plants. F. O. Alton. Elec R & W
Elec'n 67:556-7 S 25 '15
Motors operating at 3600 r.p.m. directly connected to woodworking surfaces. il Elec W
66:643-4 S 18 '15
Wood-working plant as a ship-building yard.
il diags Engineer 120:230-2, 243-5, 250 S 3-10
'15

Wool

Better preparation of American wool for mar-ket, il Textile World 49:316-18 Je '15

Bettering the wool for American mills. Tex-tile World 49:153-4 My '15

Difference in weight between raw and clean wools. W. S. Lewis. U S Bur Stand Tech Pa 57:1-5 '15; Abstract. J Fr Inst 180:473 O '15

Wool growing in the United States. Textile World 48:312-14 D '14

See also Dyes and dyeing-Wool; Woolen and worsted manufacture; Worsted

Wool finishing

Dyeing and finishing wool fabrics, F. Sadler. diags Textile World 49:365-8 Je '15

Fancy cut faced woolens, il Textile World 49: 439-40 Jl '15

Finishing piece dyed woolens, Textile World 48:526-7 F '15

Finishing process for wool goods. Textile World 50:112-13 O '15

Luster finish. Textile World 49:553-4 Ag '15 Shearing wool goods, diags Textile World 49: 523-5 Ag '15

ol growers, National association of. See National association of wool growers Wool

Wool scouring

Degreasing D'14 wool, il diag Textile World 48:305-7 Experience gained in the treatment of the wastes from the scouring of wool, H. R. Crohurst and A. D. Weston, Eng & Contr 44: 370-6 N 10 '15 Process for scouring wool. Textile World 48:

634 Mr

Wool spinning. See Woolen and worsted spinning Wool tariff

Component material of chief value. il Textile World 50:51-4 O '15

Wool trade

Pritish embargo and the American wool supply. Textile World 48:275-7 D '14
British embargo on wool trade. Textile World 49:399-402 Jl '15
British wool embargo. Textile World 48:559-62

British wool embargo. Textile World 48:559-62 Mr '15
Domestic supply of wool and dyestuffs. C: E. Wry. Textile World 49:95-6 Ap '15
English market for tops and worsted yarns. Textile World 49:506-9 Ag '15
Importing wool through the textile alliance. Textile World 49:145-6 My '15
Moisture regain for worsted tops. Textile World 49:59-61 Ap '15
Movement of wool in England and Spain. D. E. Douty. Textile World 48:480-1 F '15
National association of wool growers; 51st annual meeting at Salt Lake City, Nov. 12-14, 1914. Textile World 48:283-6 D '14
Wool and the British Empire. Textile World 48:586-8 Mr '15
Wool grower and the wool trade. Textile World 49:492-4 Ag '15
Woolen and worsted fabrics in China. T: Sammons. Textile World 49:472-5 Jl '15
See also Wool tariff

See also Wool tariff

Woolen and worsted machinery
Dunn crabbing and lustering machine. il diag
Textile World 49:373-4 Je '15
Fancy cut faced woolens. il Textile World 49:
439-40 Jl '15

Woolen and worsted manufacture
Electric driving of woolen mills, J. F. Crowley, Ind Eng 15:81-3 Ag '15
Estimating the cost of wool goods in English
mills, Textile World 49:419-24 Jl '15
Making of Scotch tweeds, T: Welsh, Textile
World 48:398-400, 501-3 Ja-F '15
Removing odors from wool. Textile World
50:100 O '15

hoddy in woolen fabrics. K. B. Lamb. il Textile World 49:154-6 My '15 See also Textile industry and fabrics; Wool; Wool finishing

### Cost

Estimating the cost of woolen goods. Textile World 48:576-7; 49:92-4 Mr-Ap '15

Woolen and worsted overseers, ciation of. See National assoc National association of. See National association of woolen and worsted overseers

Woolen and worsted spinning
Spinning of woolen yarn. Textile World 50:96-7 O '15

Woolen mills. See Woolen and worsted manufacture; Textile mills

Woolworth building, New York

Details of Woolworth tower lighting. il Elec

R & W Elec'n 66:1048-9 Je 5 '15

New York's greatest lighting spectacle. C: W. Person. il Sci Am 112:171 F 20 '15

Worcester, Massachusetts

### Architecture

irst church of Christ, Scientist, il plans Brickb 24:pl 89-90 Je '15

Large market building at Worcester, Mass. il plans Brickb 24:191-2 Ag '15

### Railroads

oston & Albany railroad improvements at Worcester, Mass. L. G. Morphy. il Boston Soc C E J 1:481-98 N '14 Boston &

Worcester polytechnic institute Washburn shops of the Worcester Polytech-nic institute. G: I. Alden. Am Soc M E J 37:391-4 JI '15

Words, Compound. See Compound words

Working classes. See Labor and laboring classes

Working classes. See Labor and laboring classes
Workmen's compensation
Compensation laws and accidents. E. N. Zern.
Colliery 35:433-5 Mr '15
Compensation laws and married men. Bldg
Age 37:55-6 Ja '15
Montana workmen's compensation law. Eng
& Min J 99:1069 Je 19 '15
Principal provisions of the employes' compensation bill pending in the Pennsylvania legislature. Iron Tr R 56:775 Ap 15 '15
Suggestions for a uniform state workmen's compensation law by the National civic federation committee. Am Gas Light J 102:92 F

Tendencies toward inefficiency in legislation. R. Walker. Ry Age 58:219-20 F 5 '15 Wisconsin compensation law. C. Muskat. Elec Ry J 45:234-5 Ja 30 '15

Vorkman's compensation in Pennsylvania. D. A. Reed. Elec Ry J 45:980-1 My 22 '15 Workman's

orkmen's compensation insurance; abstracts. W. G. Cowles. Elec W 65:1533 Je 12'15; Elec R & W. Elec'n 66:1113 Je 12'15 Workmen's See also Employers' liability

Worm gearing. See Gearing, Worm

Worry

Physiology of worry. E. D. Forrest. Sci Am S 79:21-2 Ja 9 '15

Worsted

uality numbers for worsted tops. Textile World 48:490-2 F '15 Quality

Wounds

Colloidal gold for infected wounds. Sci Am 113:234 S 11 '15 Massage in the after-treatment of the wounded. J. B. Mennell. Sci Am S 80:358 D

'15 New method of disinfecting wounds. Sci Am S 80:111 Ag 14 '15

See also Surgery

**Vrecking** 

Felling elling a brick chimney. C: A. Mead. il Eng N 73:400-1 F 25 '15

Methods and equipment used in wrecking a 101-ft. steel stack. il Eng & Contr 44:305 O 20 '15

Methods pursued in tearing down a large building. J. Rosenzweig. diag Eng N 73:666-8 Ap 8 '15

Razing a brick chimney. il Power 41:374 Mr 16'15

Razing a 400-ton brick chimney, il diag Eng N 72:1266 D 24 '14

Safe methods of wrecking buildings, diags Eng & Contr 43:98-100 F 3 '15

Tearing down a 250-ft. reinforced-concrete chimney at Philadelphia. il Eng N 73:78 Ja 14 '15

Wrecked ship's backbone broken with dynamite. il Eng Rec 72:191-2 Ag 14 '15

See also Bridge removal; Salvage

Vecking cars

Electric steam tunnel crane. il Eng & Contr 43:184 F 24 '15; Elec Ry J 45:427-8 F 27 '15; Iron Age 95:461 F 25 '15; Ry Age 58:369-70 F 26 '15; Ry R 56:280-1 F 27 '15; Sci Am S 79: 285 My 1 '15

/ren, Sir Christopher, 1632-1723 Church towers, steeples, and spires of Sir Christopher Wren, R. R. Phillips, il Brickb 24:185-9, 228-32 Ag-S '15 **Vrenches** 

Hayward combination wrench for pipes and nuts. il Iron Age 96:411 Ag 19 '15; Eng & Min J 100:518 S 25 '15

Quick-acting screwless wrenches, il Iron Age 95:995 My 6 '15

Testing

Hydraulic wrench testing device. il Mach 22: 144 O '15

Experimental study of the mechanism of writing. il Sci Am S 80:165 S 11 '15

See also Ciphers; Cuneiform writing; Inscriptions

### Identification

Science and the forger; instruments and illustrations in questioned document cases. A. S. Osborn. il Sci Am 112:434-5 My 8 '15

Wrought iron

Brittleness of wrought iron as a consequence of heating compressed material; abstract. R: Baumann. Am Soc M E J 37:605-6 O '15 Crystallization of wrought iron. Ry R 56:814-

15 Je 12 '15 Properties of Swedish wrought iron. N. Lilienberg. Iron Age 95:788-9 Ap 8 '15

# X

X ray photography. See Radiography

rays

Crays
Application of the Coolidge tube to metallurgical research. W. P. Davey. il Gen Elec R 18: 134-6 F '15; Same. Iron Age 95:500-1 Mr 4'15; Same. Sci Am S 79:331 My 22 '15; Same, with description of Coolidge tube. Engineer 119:350-1 App 9'15
Coolidge X-ray tube. R. Bown. il plan Elec W 65:396-7 F 13 '15
Hard X-rays. W. D. Coolidge. J Fr Inst 180: 492-3 O '15
Lonizing potential of an X-ray tube. E. C.

Ionizing potential of an X-ray tube. E. C. Drew. bibliog il diag J Fr Inst 179:697-709 Drew. Je '15 Je

Metallic Roentgen-ray tube; abstract. L. Zehnder, diag Elec W 65:605 Mr 6 '15 Model X-ray dark-room. W. P. Davey. plans Gen Elec R 18:1107-10 D '15 New hydrogen X-ray tube. H. C. Snook. il Sci Am S 79:71 Ja 30 '15 Notes on X-rays. W. S. Andrews. Gen Elec R 18:152 F '15 Nysics of X-rays. W. P. Davey. Gen Elec R 18:258-63, 353-8, 625-30 Ap-My, Jl '15 Radiography of metals. W. P. Davey. il Am Inst Min E Bul 104:1515-25 Ag '15; Same. Gen Elec R 18:795-800 Ag '15; Same cond. Iron Age 96:522-4 S 2 '15; Abstract. J Fr Inst 180:489-90 O '15 Recent developments in X-ray tubes. W. D.

Recent developments in X-ray tubes. W. D. Coolidge. Gen Elec R 18:224-5 Mr '15; Same. Sci Am S 79:183 Mr 20 '15
Roentgen tube; abstract. S. Russ. Elec W 65:992 Ap 17 '15
Roentgenology in war. il Sci Am S 79:68 Ja 30

Searching for contraband with X-rays. il Sci Am 112:338 Ap 10 '15
X-ray examination of built-up mica. C. N. Moore. il diag Gen Elec R 18:195-7 Mr '15; Same. Sci Am S 80:253 O 16 '15
X-ray inspection of a steel casting. W. P. Davey. il Gen Elec R 18:25-7 Ja '15; Same. Iron Age 95:186-7 Ja 21 '15; Same. Sci Am S 79:84 F 6 '15; Same. Eng M 49:106-7 Ap '15; Same. Ry Age (Mech ed) 89:170 Ap '15
X-ray spectrometer for the study of the properties of crystals. diag Sci Am S 79:19 Ja 9 '15

X-ray work in war, il Sci Am S 79:120-1 F 20

X-rays and crystalline structure. Sibley J 29: 103-6 Ja '15; Same. Sci Am S 79:82 F 6 '15 X-rays and crystalline structure. W: H. Bragg. Sci Am S 79:5-7 Ja 2 '15

See also Cathode rays; Radiography; Radiotherapy

Xylene

ylene
Action of trioxymethylene on p-xylene in the
presence of aluminum chloride. R. C. Huston and D. T. Ewing. Am Chem Soc J 37:
2394-9, 2401 O '15
Tolyl esters and toluidides of the nitrosulfonic
acids of p-xylene. R. C. Huston. Am Chem
Soc J 37:2119-22 S '15

Yachts

Galvanic corrosion damages hull of yacht. Eng N 74:522-3 S 9 '15 Three-masted auxiliary schooner yacht Sea Call. il Sci Am 112:623 Je 26 '15

Yale & Towne manufacturing co.

Efficient methods of the Yale & Towne mfg.
co. and details of its specially-equipped shop, H. C. Estep. il plans Foundry 43:129-37
Ap '15; Same (Castings for locks and hardware)., Iron Tr R 56:809-16+ Ap 22 '15

Yale club, N. Y. See New York (city)-Clubs

How Cleveland fixes sizes of courts and yards. plan Eng Rec 71:614 My 15 '15

Evenness in the manufacture of cotton yarn. Textile World 50:197-8 N '15 German yarn numbering. Textile World 48:488-90 F '15

Manufacturing spiral yarn, il diag Textile World 48:311-12 D '14 Numbering of yarn, Textile World 48:467-8 F

Points on fine yarn manufacture. C. N. Poore. Textile World 50:164-5 N '15 Strength of yarn, Textile World 48:604-6 Mr

Twists for worsted yarn. Textile World 48:509-11 F '15

Value of permutized water for processing yarns. A. R. Calvo. Textile World 49:243-4+ My '15 Weighting cotton yarn. Textile World 50:211-12

15

See also Cotton; Silk; Spinning; Textile industry and fabrics; Twine; Wool; Worsted

Yeast

Dried beer-yeast as an article of food. Sci Am S 79:311 My 15 '15 Transforming sugar into proteins and fats. H. W. Hillyer. Sci Am 113:446+ N 20 '15

Yellow fever

Discoveries of Dr. Charles J. Finlay. Sci Am 113:210 S 4 '15

Yellow poplar tree. See Tulip tree

Yellowstone national park Geology of the Yellowstone national park. C. H. Butman. il Sci Am S 79:7-9 Ja 2 '15

Yonkers, New York

Water supply

Yonkers water supply and its future development, D. F. Fulton, map Am Water Works Assn J 2:1-8 Mr '15; Discussion, 2:8-12, 311-13, 579-81 Mr, Je, S '15

Young men's Christian association
Is the railroad Y. M. C. A. really worth while?
Ry Age 58:295-6, 358-60 F 19-26 '15
Solution of the construction camp club house problem. Eng & Contr 44:118 Ag 18 '15

Young women's Christian association buildings Y. W. C. A. building, Newark, N. J.; views and plans. Brickb 24:pl 144-5 O '15

women's Hebrew association building,

New York
Young women's Hebrew association, il Arch
& Bldg 47:21-5 Ja '15

Youth's companion building, Boston, Massachusetts

Features in the construction of new building for the Youth's companion. W. B. Conant. il diags Concrete Cem 7:133-5 O '15 Large saving in steel effected by new system of flat-slab reinforcement, il plans Eng Rec 72:450-2 O 9 '15

Ypres, Belgium

Mergelynck museum at Ypres. il Am Inst Arch J 3:16-18 Ja '15

# Architecture

Architect's impressions in Belgium. E. T. Richmond. il Am Inst Arch J 3:153-8 Ap '15 Mediaeval market place of Ypres, an irreparable war loss to architecture. C. A. T. Middleton. il diags Arch Rec 37:289-99 Ap '15

Zeeland (steamship) Floating a stranded ship on air. R. G. Skerrett. il Sci Am 112:84 Ja 23'15

Zeppelins. See Balloons and airships

Analysis of spelter; report of subcommittee. J Ind & Eng Chem 7:547-8 Je '15; Same. Eng & Min J 100:439-40 S 11 '15 Australian zinc contracts. Eng & Min J 100:

524-5 S 25 '15

524-5 S 25 '15
Care in melting zinc. R. Job and F. F. White. il Iron Age 96:199 Jl 22 '15
Determination of spelter coating on sheets and wire. J. A. Aupperle. Metal Ind n s 13: 329-30 Ag '15; Same. Iron Age 96:132 Jl 15 '15; Same (Maintaining galvanizing standards) Iron Tr R 56:1310+ Je 24 '15
Economizing zinc. H. de B. Parsons. Sci Am S 80:224 O 2 '15

S 80:224 O 2 '15
Ferrocyanide determination of zinc. Eng & Min J 99:285-6 F 6 '15
Influence of impurities on zinc. Eng & Min J 99:990 Je 5 '15
Kinds of spelter. Eng & Min J 99:292-3 F 6 '15
New method for determining zinc in alloys. Eng & Min J 99:701 Ap 17 '15
Spelter and its uses. Metal Ind n s 13:4 Ja '15
Spelter and other coating metals. Met & Chem Eng 13:345 Je '15
Spelter—its manufacture and properties; with discussion. G. C. Stone. Metal Ind n s 13:370-3 S '15

3 S '15
Suggestions about the use of zinc. Old Scotch. Int Marine Eng 20:457 O '15
Testing spelter coating in France. C: Coulon. Iron Tr R 57:401, Discussion. J. A. Aupperle. 57:401 Ag 26 '15
Zinc-dust precipitation tests. N. Herz. Am Inst Min E Bul 104:1507-13 Ag '15; Abstract. Met & Chem Eng 13:973-4 D 15 '15
Zinc in the cyanide mill. A. Dorfmann. Eng & Min J 100:680 O 23 '15

See also Galvanizing

Zinc castings Cast zinc. Foundry 43:232-3 Je '15 Zinc chloride

Specification for zinc chloride treatment. W. F. Goltra. Ry Age 58:459 Mr 12 '15

Zinc industry and trade Australian zinc industry. Eng & Min J 99:704-5

Ap 17 Ap 17 '15 Case of spelter. Eng & Min J 100:234 Ag 7 '15 European war and the spelter market. W. S. Horner. Metal Work 84:7-8 Jl 2 '15 Lead and zinc movement. Eng & Min J 100:

Non-ferrous metals and the war. W. R. Ingalls. Iron Age 96:420-1 Ag 19 '15 Production of spelter in 1914. Eng & Min J 99: 207-8 Ja 23 '15

Situation in spelter. Eng & Min J 99:504-5 Mr

13 '15
Spelter market and galvanized steel sheets.
W. H. Abbott. Metal Work 83:923+ Je 25 '15
Spelter production in 1914. C. E. Siebenthal.
Iron Age 95:850-1 Ap 15 '15
Spelter statistics for 1914. W. R. Ingalls. Eng
& Min J 99:451-4 Mr 6 '15
Zinc concentrates in the British prize courts.
Eng & Min J 100:535 O 16 '15
Zinc corporation and the war. Eng & Min J
100:95-7 J1 17 '15
Zinc smelting in Great Britain. Eng & Min J
100:322-3 Ag 21 '15
Zinc statistics. Eng & Min J 99:62-6 Ja 9 '15
inc metalluray

Zinc metallurgy

Concentration at the Timber Butte mill. Simons. Met & Chem Eng 13:188-9 Mr '15 Development of zinc smelting in the United States. G: C. Stone. Met & Chem Eng 13 726-7 O 15 '15

Electromagnetic zinc-ore treatment by the Campbell process. L. E. Ives. il diag Eng & Min J 99:979-80 Je 5 '15

Electrometallurgy of zinc. Eng & Min J 100 325-6 Ag 21 '15

Flotation of Joplin-Galena slimes. G: Belchic and G. L. Allen. Met & Chem Eng 13:847 N 15 '15

French process for electrolytic zinc. Met & Chem Eng 13:888 D 1 '15 G: C. Stone

How spelter is manufactured. Iron Tr R 56:564-6+ Mr 18 '15

Leaching a zinc-lime ore with acids. O. C Ralston and A. E. Gartside. Met & Chen Eng 13:151-5 Mr '15

Main points in the economics of the metallurgy of zinc. W. R. Ingalls. Met & Chem Eng 13:725-6 O 15 '15

Metallurgy of zinc in 1914. W. R. Ingalls. Eng & Min J 99:95-6 Ja 9 '15

Mining and milling of lead and zinc ores in the Wisconsin district, Wisconsin. C. A. Wright. Il plan U S Bur Mines Tech Pa 95: 20-33 '15

New mill of the Daly West mining co., Park

20-33 '15
New mill of the Daly West mining co., Park City, Utah. L. O. Howard, il plan Met & Chem Eng 13:597-602 S 15 '15
Points in the economics of zinc metallurgy. W. R. Ingals. Eng & Min J 100:551-4 O 2 '15
Preventing blue powder in the electric reduction of zinc ores; a patent granted to Woolsey McA. Johnson. Met & Chem Eng 13:763
O 15 '15

tion of zinc ores; a patent granted to Woolsey McA. Johnson. Met & Chem Eng 13:763
O 15 '15
Production of zinc oxide from low-grade carbonate ore at Leadville. il Met & Chem Eng 13:631-3 S 15 '15
Recent improvements in the metallurgy of zinc. Eng & Min J 99:896 My 22 '15
Reduction of zinc oxide in an electric furnace; patent by F. W: Highfield. diag Met & Chem Eng 13:817 N 1 '15
Refining of zinc waste. L. J. Krom. il diags Metal Ind n s 13:281-3 Jl '15
Removal of cadmium from zinc ores. Eng & Min J 99:659 Ap 10 '15
Simmonds' retort-discharging machine. il Eng & Min J 99:659 Ap 10 '15
Smelting of metals in the electric furnace. D. A. Lyon and R. M. Keeney. U S Bur Mines Bul 77:91-101 '14
Status of zinc metallurgy in 1914. Met & Chem Eng 13:60 Ja '15
Treating zinc-bearing materials. diag Met & Chem Eng 13:504-5 Ag '15
Treating zinc-bearing materials. diag Met & Chem Eng 13:504-5 Ag '15
Susconsin zinc district. H. C. George. il diags Eng & Min J 100:385-8 S 4 '15; Correction. 100:752 N 6 '15
Zinc extraction by electrolysis. E. H. Leslie. Eng M 48:910-12 Mr '15
Zinc manufacture in the Pittsburgh district; plant of the American zinc & chemical company at Langeloth, Pa. il map Iron Age 15 in operation at south Chicago. H. B. Pulsifer. il Met & Chem Eng 13:783-5 N 1 '15
Zinc smeltery at Langeloth. W. R. Ingalls. diags plan Eng & Min J 98:985-9 D 5 '14

Zinc smelting in Great Britain. Eng & Min J 100:279 Ag 14 '15

Zinc mines and mining Geological anatomy of a Tennessee zinc mine. F. L. Nason. diags Eng & Min J 100:259-62 Ag 14 '15

Ag 14 10 Mining and milling of lead and zinc ores in the Wisconsin district, Wisconsin. C. A. Wright. U S Bur Mines Tech Pa 95:1-19 '15 New developments in the Coeur d'Alene, Idaho. H. I. Ellis. il Eng & Min J 100:337-40 Ag 28

Wisconsin zinc district, H. C. George, il diags map Eng & Min J 100:295-300, 341-4, 385-8 Ag 21-S 4 '15; Correction, 100:752 N 6 '15 Zinc mining in Wisconsin in 1914, J. E. Ken-nedy, Eng & Min J 99:65-6 Ja 9 '15

Zinc ores

inc ores Calamine mines of Sardinia. C: W. Wright. il map Eng & Min J 100:625-8 O 16 '15 Formation of the oxidized ores of zinc from the sulphide. Y. T. Wang. il Am Inst Min E Bul 105:1959-2012 S '15 Zinc deposits of eastern Tennessee. F. L. Nason. Eng & Min J 99:734-6 Ap 24 '15

Zinc poisoning

Zinc poisoning. C: H. Fulton. Eng & Min J 100:363 Ag 28 '15 Zinc poisoning. H. W. Gillett. J Ind & Eng Chem 7:550 Je '15

Zirconia

Zirconia, a new refractory. H. C. Meyer. il Met & Chem Eng 12:791-3; 13:263-6 D '14, Ap '15

Abandon bandon manufacture of new fuel zoline. Horseless Age 34:927 D 30 '14

Zones of silence. See Sound

Zoological gardens
Animal life in a zoo. A. Pope. il Sci Am 112:
385+ Ap 24 '15
Gardens of the Zoological society of London,
its history, organization, and its valuable
collections. R. W. Shufeldt. il plan Sci Am
S '79:180-1 Mr 20 '15
Mappin terraces at the Zoo. R. N. Stroyer.
il diags Engineer 119:156-7 F 12 '15

Zoology

New faunal conditions in the Canal Zone. H. E. Anthony, il Sci Am S 79:104-6 F 13 '15 See also Reproduction

South America

Roosevelt-Rondon scientific expedition. L. E. Miller, il Sci Am S 79:248-9, 268-70 Ap 17-24







